Health and Safety Plan

Swann Park Redevelopment
Baltimore, Maryland

Prepared for

Honeywell International Inc.

March 2008

Prepared by: Bill Berlett, CIH

CH2MHILL

HEALTH AND SAFETY PLAN
Swann Park Redevelopment
2000 Race Street Site
Baltimore, Maryland 21230

PHONE

Project Number: 364267

Project Manager (PM): Bob Steele/WDC.....703-376-5210
Home Office 703-830-9780
Cell 703-625-1780

Safety Coordinator (SC): Ken Biles/BIH 410-522-5200

Honeywell H&S Program Manager (HSPM): Bill Berlett/CHI.....(773) 693-3800 x-316
cell: (847) 770-0209

Project H&S Manager (HSM):Bill Berlett/CHI .....(773) 693-3800 x-316
cell: (847) 770-0209

Preparation Date: March 3, 2008

Expiration Date: December 31, 2008

APPROVALS

Project Manager:

(DATE)

Safety Coordinator

(DATE)

Honeywell Program or Project Health and Safety Manager:

March 3, 2008

CIH/CSP (DATE)

This Health and Safety Plan is valid only for this specific project as described in Section 3.0. It is not to be used for other projects or subsequent phases of this project without the written approval of the Honeywell Program Health and Safety Manager. **A copy of this plan is to be maintained at the site at all times.**

Change Management Form

Honeywell Project HS&E Change Management Form

*This evaluation form should be reviewed on a **continuous** basis to determine if the current site health and safety plan adequately addresses ongoing project work, and should be completed whenever new tasks are contemplated or changed conditions are encountered.*

Project Task:	Swann Park Redevelopment		
Project Number:	364267	Project/Task Manager:	Bob Steele/WDC
Name:	Swann Park	Safety Coordinator	Ken Biles/BIH
	2000 Race Street Site		
	Baltimore, Maryland		

	Evaluation Checklist	Yes	No
1.	Have the CH2MHILL staff listed in the original HSP/FSI changed?	X	
2.	Has a new subcontractor been added to the project?	X	
3.	Is any chemical or product to be used that is not listed in Attachment 2 of the plan?		
4.	Have additional tasks been added to the project, which were not originally addressed in the plan?	X	
5.	Have new contaminants or higher than anticipated levels of original contaminants been encountered?	X	
6.	Have other safety, equipment, activity or environmental hazards been encountered that are not addressed in the plan?	X	

If the answer is "YES" to Question 3, an HSP/FSI revision is NOT needed. Please take the following actions:

- Add the chemical to Attachment 2;
- Ensure employees handling the chemical are trained; and
- Ensure training documentation is added to Attachment 3.

If the answer is "YES" to Questions 1, 2 or 4-6, an HSP/FSI revision MAY BE NEEDED. Please contact Bill Berlett (773-693-3800 x316) directly.

Emergency Contacts

24-hour CH2M HILL Emergency Beeper – (720) 286-4911

CH2M HILL Occupational Health Nurse – 1-800-756-1130

Medical Emergency – 911 **Fire/Spill Emergency -- 911** **Security & Police – 911** Local Facility Emergency Response Number: NA	**CH2M HILL Medical Consultant** Health Resources Dr. Jerry H. Berke, M.D., M.P.H. 600 West Cummings Park, Suite 3400 Woburn, MA 01801-6350 1-781-938-4653 (8 am to 11 pm EST) 1-800-350-4511 (after hours and on weekends) (After hours calls will be returned within 20 minutes)
Client Contact Name: Chris French Company: Honeywell International Title: Environmental Manager Phone: 973-455-4131 Cell: 973-216-7501	**Site Contact** Name: Ken Biles Company: CH2M HILL Title: Engineer Phone: 410-522-5293 Cell: 443-271-6694
Honeywell Health, Safety & Environment Program Manager (HSPM) Name: Bill Berlett/CHI Phone: 773-693-3800 x 316 Cell: 847-770-0209 Fax: 773-693-3823	**Environmental Compliance Coordinator (ECC)** Name: Linda Schwan/ATL Phone: 770-604-9182 x561
Project Health & Safety Manager (HSM) Name: Bill Berlett/CHI Phone: see above	**Safety Coordinator (SC)** Name: Ken Biles Phone: 410-522-5200 Cell: 443-271-6694
Project Manager (PM) Name: Bob Steele/WDC Phone: 703-376-5210 Cell: 703-625-1780 Home Office: 703-830-9780	**Regional Human Resources Department (Workers' Compensation Contact)** Name: Cindy Bauder/WDC Phone: 703/471-6405 ext. 4243
Federal Express Dangerous Goods Shipping Phone: 800/238-5355 **CH2M HILL Emergency Number for Shipping Dangerous Goods** Phone: 800/255-3924	**Worker's Compensation:** Contact Regional HR dept. to have form completed or contact Albert Jerman after hours: 303-741-5927 **Automobile Accidents:** Rental: Linda Anderson/DEN 720-286-2401 CH2M HILL owned vehicle: Zurich Insurance Co. 800-987-3373
Facility Alarms: None	**Evacuation Assembly Area(s):** NW corner of site (See Site Map)
Facility/Site Evacuation Route(s): See Site Map	

Hospital Name/Address:

Maryland General Hospital

Phone: 410-225-8000

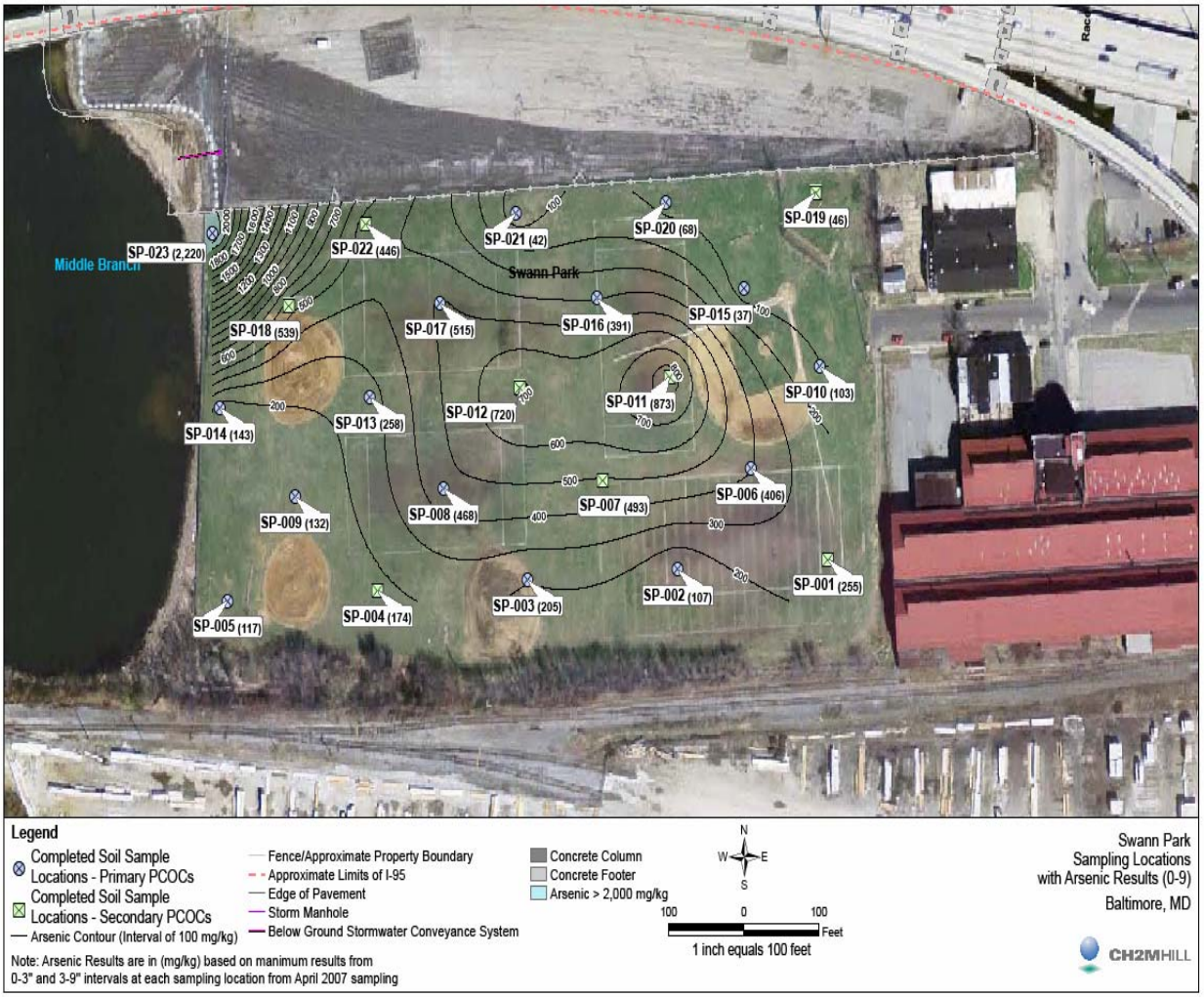
Directions to Hospital

Directions		Distance
Total Est. Time: 7 minutes	**Total Est. Distance:** 3.52 miles	
	**1:** Start out going SOUTH on RACE ST toward W MCCOMAS ST.	<0.1 miles
	**2:** Turn LEFT onto W MCCOMAS ST.	<0.1 miles
	**3:** Turn LEFT onto MD-2 / S HANOVER ST.	<0.1 miles
	**4:** Merge onto I-95 S toward I-395 / WASHINGTON / DOWNTOWN.	0.3 miles
	**5:** Merge onto I-395 N via EXIT 53 toward DOWNTOWN / M L KING BLVD.	0.5 miles
	**6:** Take the M.L. KING JR. BLVD exit.	0.3 miles
	**7:** Turn SLIGHT LEFT onto MARTIN LUTHER KING JR BLVD.	1.8 miles
	**8:** Stay STRAIGHT to go onto W READ ST.	<0.1 miles
	**9:** Turn RIGHT onto LINDEN AVE.	0.1 miles
	**10:** End at **Maryland General Hospital:** 827 Linden Ave, Baltimore, MD 21201, US	
Total Est. Time: 7 minutes	**Total Est. Distance:** 3.52 miles	

Start:
2000 Race St
Baltimore, MD 21230, US

End:
Maryland General Hospital:
410-225-8000
827 Linden Ave, Baltimore, MD 21201, US

Site Map


Middle Branch
Swann Park
SP-023 (2,220)
SP-022 (446)
SP-021 (42)
SP-020 (68)
SP-019 (46)
SP-018 (539)
SP-017 (515)
SP-016 (391)
SP-015 (37)
SP-014 (143)
SP-013 (258)
SP-012 (720)
SP-011 (873)
SP-010 (103)
SP-009 (132)
SP-008 (468)
SP-007 (493)
SP-006 (406)
SP-005 (117)
SP-004 (174)
SP-003 (205)
SP-002 (107)
SP-001 (255)
Legend
Completed Soil Sample Locations - Primary PCOCs
Completed Soil Sample Locations - Secondary PCOCs
Arsenic Contour (Interval of 100 mg/kg)
Fence/Approximate Property Boundary
Approximate Limits of I-95
Edge of Pavement
Storm Manhole
Below Ground Stormwater Conveyance System
Concrete Column
Concrete Footer
Arsenic > 2,000 mg/kg
N
W
E
S
100 0 100
Feet
1 inch equals 100 feet
Note: Arsenic Results are in (mg/kg) based on manimum results from 0-3" and 3-9" intervals at each sampling location from April 2007 sampling
Swann Park
Sampling Locations
with Arsenic Results (0-9)
Baltimore, MD
CH2MHILL

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Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
APR	air-purifying respirator
cm	centimeter
CNS	central nervous system
COPC	chemical of potential concern
CPR	cardiopulmonary resuscitation
Cr	chromium
dBA	decibel (A-weighted scale)
DEET	N,N-diethyl-meta-toluamide
DOT	Department of Transportation
ECC	Environmental Compliance Coordinator
GFCI	ground fault circuit interrupter
Hazwoper	Hazardous waste operations and emergency response
Honeywell	Honeywell International Inc.
HR	heart rate
HS&E	health, safety, and environment
HSM	Health and Safety Manager
HSPM	Health and Safety Program Manager
IDLH	immediately dangerous to life and health
IRF	incident report form
JHA	job hazard analysis
LID	Legal and Insurance Department
MSDS	material safety data sheet
NIOSH	National Institute for Occupational Safety and Health
NSC	National Safety Council
OSHA	Occupational Safety and Health Administration

PAH	poly-aromatic hydrocarbon
PAPR	powered air-purifying respirator
PCB	poly-chlorinated biphenyl
PCE	tetrachlorethene
PEL	permissible exposure limit
PFD	personal flotation device
PIP	photoionization potential
PM	Project Manager
PPE	personal protective equipment
ppm	parts per million
PTSP	pre-task safety plan
RES	Remediation and Environmental Services
RQ	reportable quantity
SC	Safety Coordinator
SCBA	self-contained breathing apparatus
SOP	standard of practice
SPCC	spill prevention, control, and countermeasures
SSR	Subcontractor Safety Representative
TCE	trichloroethene
TLV	threshold limit value
TSDF	treatment, storage, and disposal facility

1.0 Introduction

1.1 About This Document

This Health, Safety and Environment (HS&E) Plan will be kept on the site during all field activities conducted under the Honeywell International Inc. (Honeywell) Alliance program. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The plan adopts, by reference, the Standards of Practice (SOPs) in the CH2M HILL *Health, Safety, and Environmental Protection (HS&E) Program Manual*. In addition, this plan adopts procedures in the project Work Plan and incorporates applicable elements of Honeywell's HS&E requirements. The Safety Coordinator (SC) is to be familiar with the SOPs contained in the HS&E Program Manual and the contents of this plan. The project Health and Safety Manager (HSM) must review and approve any changes to this plan.

CH2M HILL personnel and subcontractors must sign the CH2M HILL Employee Sign-Off Form included in Attachment 1 after reading/reviewing this HS&E Plan.

1.2 Site Background

Swann Park is located in south-central Baltimore City (Figure 2-1). The park property currently consists of approximately 11 acres of athletic fields and associated green space (Figures 2-2). There are eight athletic fields at the park consisting of one baseball field, three softball fields, and four fields used for soccer, football, and other sports (Figure 2-2). There are no buildings on Swann Park and the only structures are associated with the athletic fields (e.g., scoreboards and backstops).

Swann Park is currently owned by the City of Baltimore and has been used as a park since circa-1905 (City of Baltimore, 1905). A stone bulkhead located along the western property boundary was constructed between 1905 and 1912 and a storm drain line that crosses through the park was constructed circa 1912 (City of Baltimore, 1912).

Swann Park is immediately surrounded by properties that are used primarily for industrial purposes. Specifically, land use on immediately adjacent properties and features consists of the following:

- The Middle Branch of the Patapsco River (Middle Branch) bounds Swann Park to the west.
- The Western Maryland Railroad bounds Swann Park to the south.
- The Schuster Concrete facility bounds Swann Park to the east (south of McComas Street).
- An unoccupied building bounds Swann Park to the east (north of McComas Street).

- The location of a former pesticide manufacturing facility (referred to as the "2000 Race Street Site") bounds Swann Park to the north. This property is currently owned primarily by the City of Baltimore and is now covered with an engineered asphalt and clay cap.

Residential units are located to the east Swann Park. These units, consisting of seven row-houses, lie between McComas Street and the Schuster Concrete facility. The western-most row house is separated from the park boundary by a distance of approximately 90 feet across an open parking area.

On April 24, 2007, the Maryland Department of the Environment (MDE) issued an administrative order to the City of Baltimore (City) and Honeywell International Inc. (Honeywell) to investigate and propose a remedy for Swann Park. With the City's assistance, Honeywell has undertaken a thorough investigation of environmental conditions in soil and groundwater at Swann Park, has completed a human health risk evaluation in accordance with MDE and United States EPA guidance, and has evaluated a number of possible approaches to cleaning up the Park. In this report, Honeywell and the City jointly proposed a cleanup approach that will protect human health and the environment and promptly return the Park to the community for recreational use. The proposed cleanup includes:

- Removing 7,900 cubic yards of arsenic-contaminated soil;
- Covering the entire park surface with a clean soil layer that is two feet deep to ensure the protection of park users by preventing contact with the remaining soil; and
- Constructing utility corridors to protect utility workers.

In April, 2007, at MDE's request, Honeywell collected 46 shallow soil samples from Swann Park. Subsequently, under MDE's Order, Honeywell collected 21 additional discrete and composite surficial soil samples and also collected 36 additional deeper soil samples. All told, Honeywell collected more than 100 soil samples. In addition, Honeywell collected eight groundwater samples from the Park. The samples were analyzed by an independent laboratory for a broad range of potential contaminants, including metals, pesticides, and volatile and semi-volatile organic compounds.

The laboratory results demonstrated that arsenic is the only chemical that is consistently detected in soil at the Site at levels that exceed MDE's regulatory screening criteria. In general, the results also demonstrated that the highest levels of arsenic were found in the northwest corner of the Park and along the northern boundary with the former Race Street plant. Further, the results indicated that arsenic levels in soil generally are higher at the surface and decline with soil depth below the surface, except along the northern property line, suggesting limited downward migration of arsenic from the surface soils to deeper soils

1. Surface Soils—Arsenic detections in surficial soils (0 to 3 inches deep) are fairly widespread across the Park but are highest in the northwest corner of the Site where, at one location, arsenic levels exceed 800 mg/kg. A defined area of arsenic detections that exceed 200 mg/kg is present in surficial soils in the central portion of the Site, and most (but not all) concentration values in surface soils exceed 100 mg/kg across the Site. The

volume averaged concentration of arsenic in surface soils across the entire 10.4 acre park was calculated to be approximately 175 mg/kg.

2. Shallow Subsurface Soils—Soils between 9 inches and 2 feet below the surface also contained arsenic, but at levels below those found at the surface except for an area along the northern Park boundary. The majority of soil samples in this depth range contained arsenic below 100 mg/kg although higher concentrations were found along the northern Park boundary and in the northwest corner.

3. Subsurface Soils—At depths between 2 feet and 5 feet below the surface, arsenic concentrations were detected below approximately 50 mg/kg across most of the Site, except for a few locations along the eastern boundary and the northwest corner.

Groundwater data demonstrated that arsenic is the only contaminant detected above relevant regulatory criteria. Elevated levels of arsenic in groundwater are limited to the northwestern corner of the site, and appear to be related to the high levels of arsenic found in soil in the same general area. In addition, arsenic is present in a segment of the storm drain system that runs beneath the park. The limited spatial distribution of arsenic concentrations in groundwater, together with the geochemistry of the water, indicates that the elevated arsenic conditions are localized to the northwest corner of the park. Groundwater at Swann Park is not a source of drinking water.

MDE's Order required the completion of a human health risk evaluation that is used to develop risk-based remediation goals. These goals were developed using site-specific data to the extent such data was available, including:

- Site-specific data regarding the bioavailability of the arsenic at the park and the mineral phases in which it is found were incorporated into the risk evaluation; and
- The amount of time recreational users might spend at the park were based on high school athletic schedules, recreational sports league schedules, and other information regarding actual historic and projected use of Swann Park.

The risk evaluation considered four basic categories of park users: a high-school youth playing sports at the park, an adult playing recreational sports at the park, a child watching sporting events, and a construction/utility worker. Remedial goals were calculated for each type of Park user to correspond to a hazard index of 1 or an incremental cancer risk of 1×10^{-5} (1 in 100,000). Based on the health evaluation, the calculated remedial goals for arsenic were 212 mg/kg for recreational users and 454 mg/kg for construction workers.

Although MDE's order required a human health risk evaluation and the report contains information based on that requirement, the recommended remedy eliminates the potential exposure pathways to the public. As discussed further below, the placement of a minimum of two feet of clean soil over the entire Park surface area ensures the protection of recreational users by eliminating their potential for exposure to any soil that is currently at the Park. Utility or construction workers are protected by removal of soils above risk-based concentrations before the clean cover is placed. In addition, utility corridors will be excavated and backfilled with clean soil where primary utilities are to be located.

1.3 Description of Tasks

Refer to the project Work Plans for detailed task information. A task hazard analysis has been performed for each task and is included below while project-specific hazard controls are provided in the next section. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin. Refer to Hazwoper Compliance Plan Section of this HS&E Plan for procedures related to "clean" tasks that do not involve hazardous waste operations and emergency response (Hazwoper).

1.3.1 Hazwoper-Regulated Tasks

The following tasks are regulated under the Occupational Health and Safety Administration (OSHA), Paragraph 1910.120 - HAZWOPER.

Oversee the redevelopment of Swann Park, which will include the following major work tasks:

- Excavate, load and transport off site arsenic-impacted soils greater than 454 mg/kg
- Conduct confirmatory soil sampling following excavation of arsenic-impacted soil.
- Re-grade entire site
- Dig utility trenches (2 feet below grade) for site utilities such as sewer, water, and electrical conduit
- Place geotextile layer inside each trench, place utilities, re-grade utility trenches
- Place marker geotextile fabric over entire site
- Cap entire site with 2- feet of clean fill material
- Perform site prep work such as concrete pad placement and seed ball fields

1.3.2 Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. The following tasks are considered non-hazardous.

- Site visits and walkthrough

1.3.3 Environmental-Regulated Tasks and Conditions

Project tasks and site conditions that can impact the environment and are otherwise subject to environmental regulation are included in Section 1.3. These items are also known as the environmental aspects of the project (activities that can interact with the environment). Environmental impacts relating to each task or condition are also presented in Section 1.3, which is used to evaluate the project's significant impacts and control measures specified in Hazard Controls and Safe Work Practices section of this HS&E Plan.

All personnel shall: (1) implement control measures described in Hazard Control Section; (2) obtain appropriate environmental training (e.g., Waste Management or Dangerous Goods Shipping) and (3) seek assistance from the regional Environmental Compliance Coordinator (ECC) for all environmental questions or issues.

1.3.4 Honeywell Permit Required Tasks

[Permits required at active Honeywell facilities and will be issued by Honeywell. While permits are not required for non-facility projects, we must meet the intent of Honeywell's permit program.]

The following tasks require a Honeywell permit: **Not applicable at this site.**

1.4 Task Hazard Analysis

Table 1-1 presents the hazard analysis for work to be conducted under this HS&E Plan.

1.5 Environmental Impacts

Table 1-2 summarizes the potential environmental impacts of the work to be conducted under this HS&E Plan.

Major Tasks	Aerial Lifts	Back Injury (Bending/Lifting)	Biological Hazards	Buried Utilities	Cold Stress	Chemical /Contaminant Exposure	Electrical	Elevated Work Areas/Falls	Entanglement	Excavations	Fires	Flying Debris/Objects	Gas Cylinders	Hand and Power Tools	Heat Stress	Heavy Equipment Exposure	Ionizing Radiation	Lockout-Tagout	Noise	Radio-Frequency Radiation	Respiratory Protection	Slips, Trips and Falls	Stairways and Ladders	Suspended Loads	Traffic Exposure	Vehicle Backing Exposure	Working Above or Near Water
Oversight of subcontractors		X	X			X				X	X	X			X	X			X		X	X			X	X	X
Excavate, load and transport off site arsenic impacted soil		X	X	X		X	X			X	X	X		X	X	X			X		X	X		X	X	X	X
Confirmatory soil sampling		X	X			X			X					X	X							X			X	X	X
Re-grade entire site		X	X			X					X	X		X	X	X			X			X			X	X	X
Utility trench work – dig trenches, place marker fabric, place utilities, re-grade -		X	X	X		X	X			X	X	X		X	X	X			X			X		X	X	X	X
Place marker fabric over entire site		X	X			X						X		X	X							X			X	X	X
Cap entire site with 2-feet of clean fill		X	X								X	X		X	X	X			X			X		X	X	X	X
Site Prep work		X	X				X					X		X	X	X			X			X			X	X	X

Bold items will be performed by CH2M HILL personnel – other tasks to be performed by subcontractor personnel

TABLE 1-2
Environmental Impacts Table

Tasks/Conditions ***[Add or remove items as needed]***	**Impacts**						
	Air Pollution	**Land Pollution**	**Land Disposal**	**Noise Pollution**	**Water Pollution**	**Resource Depletion**	**Human Hazard**
Chemical/Petroleum Storage or Transport	X	X			X		X
Coastal and Wetland Resources Disturbed						X	
Waste (Haz/Non-Haz) Mgmt, Transport and Disposal	X	X	X		X		X
Water (Waste or Storm) Stored or Discharged		X	X		X		X

2.0 Hazard Controls and Safe Work Practices

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the SC for clarification. In addition to the hazard controls specified in this section, the following are required for Honeywell projects.

2.1 Administrative Controls

2.1.1 HS&E Plans

CH2M HILL requires HS&E plans for all field projects and subcontractors are required to submit detailed Job Hazard Analysis for their activities. The HS&E plan provides a risk analysis of each task and identifies the potential hazards and control measures (including personal protective equipment (PPE) and air monitoring requirements) for each task.

2.1.2 Job Hazard Analysis

A job hazard analysis (JHA) is required by CH2M HILL for all tasks unless the HSM specifically determines it is unnecessary. The JHA provides a step-by-step analysis of the activity being performed and identifies the equipment and control measures necessary to conduct the work safely. Each JHA must be reviewed by the work team immediately prior to conducting the work. The JHA can be a source of information for the daily safety meeting. Project-specific JHAs are provided in Attachment 2.

The subcontractor shall develop a detailed JHA for each of their major tasks and submit them to CH2M HILL for review prior to site activities beginning. These JHAs shall remain on site throughout the entire project.

2.1.3 Safety Meetings

CH2M HILL requires that the safety coordinator conduct daily safety meetings to discuss with the field team the task to be performed that day and the potential hazards and mitigation measure. The safety meeting can be used to review the JHA with the team. A Daily Tailgate Safety Briefing Form is included in Attachment 3.

A Pre-Task Safety Plan (PTSP) must be developed each day prior to performing specific work tasks. Each member of the team performing the task must be included in the planning so all are aware of the task hazards and controls. A copy of a PTSP is included in Attachment 4. All subcontractor personnel shall attend the daily safety meetings and

actively participate in the development of the PTSP for their work activities planned for each day.

2.1.4 Self-Assessments

Project Activity Self-Assessment Checklists are contained in Attachment 5. These checklists provide a method of verifying compliance with established safe work practices, regulations, and industry standards pertaining to hazardous activities. The checklists can be used by any CH2M HILL employee who may be exposed to a hazardous activity or by the SC when providing oversight of a subcontractor performing a hazardous activity. Self-assessments shall be completed prior to subjecting CH2M HILL staff to hazardous operations for any reason.

Self-assessment checklists should be completed initially upon activity startup, then once per week thereafter.

If hazardous conditions exist or are apparent during the self-assessment, immediately notify the employees in the area and do not continue work in that area until the conditions are safe. If an imminent danger situation (immediately life threatening or would cause serious injury) exists, immediately stop work, warn all personnel in danger and notify the appropriate safety representative and the CH2M HILL SC. Non-compliance issues identified during the self-assessment shall be immediately rectified. If corrective action assistance is required, the HSM should be contacted for guidance.

Any site-specific requirements outlined in this HS&E Plan that are more stringent than those contained in the self-assessment checklists are to take precedence. The self–assessment checklists are based upon minimum regulatory compliance and some site-specific requirements may be more stringent. The self-assessment checklists, including documented corrective actions, shall be made part of the permanent project records and maintained by the SC.

2.1.5 Site Compliance/Audits

In order to ensure compliance with requirements contained in the Honeywell Remediation and Environmental Services (RES) Health and Safety Manual, Specification 01620, and with this HS&E Plan, audits will be conducted by a HS&E professional as follows: *at least one field audit will be conducted during the redevelopment project activities*. Additional audits may be scheduled if work conditions or activities are altered.

2.1.6 Interventions

Honeywell requires that we intervene whenever we see someone exhibiting an unsafe behavior or working in unsafe conditions. When such a situation is observed, an intervention is performed by talking to the person about how the task could be done more safely. Safe Work Observation forms must be completed on a weekly basis, at a minimum, by the SC or FTL. Each completed form must be maintained with the HS&E Plan field documents, and then transferred to project files upon the completion of the field work. A copy of a Safe Work Observation form is included in Attachment 6.

2.2 Project-Specific Hazards and Controls

The following sections describe potential hazards and control measures that may be encountered during site activities.

2.2.1 Earthmoving Equipment

- Only authorized personnel are permitted to operate earthmoving equipment.
- Maintain safe distance from operating equipment and stay alert of equipment movement. Avoid positioning between fixed objects and operating equipment and equipment pinch points, remain outside of the equipment swing and turning radius. Pay attention to backup alarms, but not rely on them for protection. Never turn your back on operating equipment.
- Approach operating equipment only after receiving the operator's attention. The operator shall acknowledge your presence and stop movement of the equipment. Caution shall be used when standing next to idle equipment; when equipment is placed in gear it can lurch forward or backward. Never approach operating equipment from the side or rear where the operator's vision is compromised.
- When required to work in proximity to operating equipment, wear high-visibility vests to increase visibility to equipment operators. For work performed after daylight hours, vests shall be made of reflective material or include a reflective stripe or panel.
- Do not ride on earthmoving equipment unless it is specifically designed to accommodate passengers. Only ride in seats that are provided for transportation and that are equipped with seat belts.
- Stay as clear as possible of all hoisting operations. Loads shall not be hoisted overhead of personnel.
- Earthmoving equipment shall not be used to lift or lower personnel.
- If equipment becomes electrically energized, personnel shall be instructed not to touch any part of the equipment or attempt to touch any person who may be in contact with the electrical current. The utility company or appropriate party shall be contacted to have line de-energized prior to approaching the equipment.
- H&S Self-Assessment Checklist – Earthmoving equipment, found in Attachment 5 of this plan, should be used to evaluate the activities being conducted by the contractors operating heavy equipment

2.2.2 Excavation

- Do not enter the excavations unless completely necessary, and only after the competent person has completed the daily inspection and has authorized entry.
- Follow all excavation entry requirements established by the competent person.
- Do not enter excavations where protective systems are damaged or unstable.
- Do not enter excavations where objects or structures above the work location may become unstable and fall into the excavation.
- Do not enter excavations with the potential for a hazardous atmosphere until the air has been tested and found to be at safe levels.

- Do not enter excavations with accumulated water unless precautions have been taken to prevent excavation cave-in.
- H&S Self-Assessment Checklist – Excavations, found in Attachment 5 of this plan, should be used to evaluate excavations.

2.2.3 Respiratory Protection

Requirements for respiratory protection include:

- Respirator users must have completed appropriate respirator training within the past 12 months. Level C training is required for air-purifying respirators (APR) use and Level B training is required for supplied-air respirators (SAR) and self-contained breathing apparatus (SCBA) use. Specific training is required for the use of powered air-purifying respirators (PAPR).
- Respirator users must complete the respirator medical monitoring protocol and been approved for the specific type of respirator to be used.
- Tight-fitting facepiece respirator (negative or positive pressure) users must have passed an appropriate fit test within past 12 months.
- Respirator use shall be limited to those activities identified in this plan. If site conditions change, the HSM shall be notified to amend the respiratory protection requirements.
- Tight-fitting facepiece respirator users shall be clean-shaven and shall perform a user seal check before each use.
- Canisters/cartridges shall be replaced according to the change-out schedule specified in this plan. Respirator users shall notify the SC of any detection of vapor or gas breakthrough. The SC shall report any breakthrough events to the HSM.
- Respirators in regular use shall be inspected before each use and during cleaning
- Respirators in regular use shall be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition.
- Respirators shall be properly stored to protect against contamination and deformation.
- Field repair of respirators shall be limited to routine maintenance. Defective respirators shall be removed from service.
- When breathing air is supplied by cylinder or compressor, the SC shall verify the air meets Grade D air specifications.
- The SC shall complete the H&S Self-Assessment Checklist – Respiratory Protection included in Attachment 5 of this plan to verify compliance with CH2M HILL's respiratory protection program.

Refer to CH2M HILL HSE SOP-121, Respiratory Protection, for additional information.

2.2.4 Exposure to Public Vehicular Traffic

The following precautions must be taken when working around traffic, and in or near an area where traffic controls have been established by a contractor.

- Exercise caution when exiting traveled way or parking along street – avoid sudden stops, use flashers, etc.
- Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.
- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.
- Remain aware of factors that influence traffic related hazards and required controls – sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.
- Always remain aware of an escape route -- behind an established barrier, parked vehicle, guardrail, etc.
- Always pay attention to moving traffic – never assume drivers are looking out for you
- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from traffic, a "buddy system" should be used, where one worker is looking towards traffic.
- When working on highway projects, obtain a copy of the contractor's traffic control plan.
- Work area should be protected by a physical barrier – such as a K-rail or Jersey barrier.
- Review traffic control devices to ensure that they are adequate to protect your work area. Traffic control devices should: 1) convey a clear meaning, 2) command respect of road users, and 3) give adequate time for proper traffic response. The adequacy of these devices are dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.
- Either a barrier or shadow vehicle should be positioned a considerable distance ahead of the work area. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion. All vehicles within 40 feet of traffic should have an orange flashing hazard light atop the vehicle.
- Except on highways, flaggers should be used when 1) two-way traffic is reduced to using one common lane, 2) driver visibility is impaired or limited, 3) project vehicles enter or exit traffic in an unexpected manner, or 4) the use of a flagger enhances established traffic warning systems.

- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers. Vehicles should be parked at least 40 feet away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.

Refer to CH2M HILL HSE SOP-216, Traffic Control, for additional information.

2.2.5 Noise Hazards

Previous surveys indicate that heavy equipment such as drilling or excavation equipment may produce continuous and impact noise at or above the action level of 85 decibels (dBA). All CH2M HILL personnel within 25 feet of operating equipment, or near an operation that creates noise levels high enough to impair conversation, shall wear hearing protective devices (either muffs or plugs). Personnel will wash their hands with soap and water prior to inserting ear plugs to avoid initiating ear infections.

Refer to CH2M HILL HSE SOP-108, Hearing Conservation Program, for additional information.

2.3 General Hazards and Controls

2.3.1 General Practices and Housekeeping

General "good housekeeping" practices include:

- Site work should be performed during daylight hours whenever possible. Work conducted during hours of darkness require enough illumination intensity to read a newspaper without difficulty.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.
- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.

- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.

Refer to CH2M HILL HSE SOP-209, General Practices, for additional information.

2.3.2 Hazard Communication

The SC is to perform the following:

- Complete an inventory of chemicals brought to the site by CH2M HILL using Attachment 7.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Copies of all applicable MSDSs will be placed in Attachment 8.
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific hazard communication training using Attachment 9.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

Refer to CH2M HILL HSE SOP-107, Hazard Communication, for additional information.

2.3.3 Shipping and Transportation of Chemical Products

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

Refer to CH2M HILL's Procedures for Shipping and Transporting Dangerous Goods for additional information.

2.3.4 Lifting

Proper lifting techniques must be used when lifting any object:

- Plan storage and staging to minimize lifting or carrying distances.
- Split heavy loads into smaller loads.

- Use mechanical lifting aids whenever possible.
- Have someone assist with the lift -- especially for heavy or awkward loads.
- Make sure the path of travel is clear prior to the lift.

Refer to CH2M HILL HSE SOP-112, Lifting, for additional information.

2.3.5 Fire Prevention

Fire prevention measures include the following:

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
  - be maintained in a fully charged and operable condition,
  - be visually inspected each month, and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

Refer to CH2M HILL HSE SOP-208, Fire Prevention, for additional information.

2.3.6 Electrical

Electrical safety measures include:

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.

- All temporary wiring, including extension cords and electrical power tools, must have ground fault circuit interrupters (GFCIs) installed.
- Extension cords must be:
  - equipped with third-wire grounding.
  - covered, elevated, or protected from damage when passing through work areas.
  - protected from pinching if routed through doorways.
  - not fastened with staples, hung from nails, or suspended with wire.
- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV.
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

Refer to CH2M HILL HSE SOP-206, Electrical, for additional information.

2.3.7 Stairways and Ladders

Safety guidelines pertaining to stairways and ladders include the following:

- Stairway or ladder is generally required when a break in elevation of 19 inches or greater exists.
- Personnel should avoid using both hands to carry objects while on stairways; if unavoidable, use extra precautions.
- Personnel must not use pan and skeleton metal stairs until permanent or temporary treads and landings are provided the full width and depth of each step and landing.
- Ladders must be inspected by a competent person for visible defects prior to each day's use. Defective ladders must be tagged and removed from service.
- Ladders must be used only for the purpose for which they were designed and shall not be loaded beyond their rated capacity.
- Only one person at a time shall climb on or work from an individual ladder.
- User must face the ladder when climbing; keep belt buckle between side rails

- Ladders shall not be moved, shifted, or extended while in use.
- User must use both hands to climb; use rope to raise and lower equipment and materials
- Straight and extension ladders must be tied off to prevent displacement
- Ladders that may be displaced by work activities or traffic must be secured or barricaded
- Portable ladders must extend at least 3 feet above landing surface
- Straight and extension ladders must be positioned at such an angle that the ladder base to the wall is one-fourth of the working length of the ladder
- Stepladders are to be used in the fully opened and locked position
- Users are not to stand on the top two steps of a stepladder; nor are users to sit on top or straddle a stepladder
- Fixed ladders $\geq$ 24 feet in height must be provided with fall protection devices.
- Fall protection should be considered when working from extension, straight, or fixed ladders greater than six feet from lower levels and both hands are needed to perform the work, or when reaching or working outside of the plane of ladder side rails.

Refer to CH2M HILL HSE SOP-214, Stairways and Ladders, for additional information.

2.3.8 Heat Stress

Prevention measures to avoid heat stress include:

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°F to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).
- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.

- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SC to avoid progression of heat-related illness.

Symptoms and treatment of heat stress are summarized in Table 2-1.

TABLE 2-1
Symptoms and Treatment of Heat Stress

Type of Heat Stress	Signs and Symptoms	Treatment
Heat Syncope	Sluggishness or fainting while standing erect or immobile in heat.	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.
Heat Rash	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.
Heat Cramps	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Remove to cooler area. Rest lying down. Increase fluid intake.
Heat Exhaustion	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.
Heat Stroke	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.	Cool rapidly by soaking in cool–but not cold–water. Call ambulance, and get medical attention immediately!

Monitoring Heat Stress

These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high (>50 percent), or when workers exhibit symptoms of heat stress.

- The heart rate (HR) should be measured by the radial pulse for 30 seconds, as early as possible in the resting period.
- The HR at the beginning of the rest period should not exceed 100 beats/minute, or 20 beats/minute above resting pulse.
- If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same.
- If the pulse rate still exceeds 100 beats/minute at the beginning of the next rest period, the work cycle should be further shortened by 33 percent.
- The procedure is continued until the rate is maintained below 100 beats/minute, or 20 beats/minute above resting pulse.

Refer to CH2M HILL HSE SOP-211, Heat and Cold Stress, for additional information.

2.3.9 Cold Stress

Prevention measures to avoid cold stress include:

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in cool weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-Chill Index is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.
- Persons who experience initial signs of immersion foot, frostbite, hypothermia should consult the SC to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

Symptoms and treatment of cold stress are summarized in Table 2-2.

TABLE 2-2
Symptoms and Treatment of Cold Stress

Type of Cold Stress	Signs and Symptoms	Treatment
Immersion (Trench) Foot	Feet discolored and painful; infection and swelling present.	Seek medical treatment immediately.
Frostbite	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Remove victim to a warm place. Re-warm area quickly in warm–but **not** hot–water. Have victim drink warm fluids, but **not** coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.
Hypothermia	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.	Remove victim to a warm place. Have victim drink warm fluids, but not coffee or alcohol. Get medical attention.

Refer to CH2M HILL HSE SOP-211, Heat and Cold Stress, for additional information.

2.3.10 Compressed Gas Cylinders

Safety measures pertaining to handling compressed gas cylinders include:

- Valve caps must be in place when cylinders are transported, moved, or stored.
- Cylinder valves must be closed when cylinders are not being used and when cylinders are being moved.
- Cylinders must be secured in an upright position at all times.
- Cylinders must be shielded from welding and cutting operations and positioned to avoid being struck or knocked over; contacting electrical circuits; or exposed to extreme heat sources.
- Cylinders must be secured on a cradle, basket, or pallet when hoisted; they may not be hoisted by choker slings.

2.3.11 Procedures for Locating Buried Utilities

Local Utility Mark-Out Service:

Name:	Miss Utility
Phone:	1-800-257-7777

The SC/PM shall complete this information as soon as it is determined.

Procedures for locating buried utilities include:

- Contact your local utility location service.
- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change n advancement of auger or split spoon).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SSC should confirm that arrangement.

2.3.12 Confined Space Entry

No confined space entry will be permitted. Confined space entry requires additional health and safety procedures, training, and a permit. If conditions change such that confined-space entry is necessary, contact the HSM to develop the required entry permit.

When planned activities will not include confined-space entry, permit-required confined spaces accessible to CH2M HILL personnel are to be identified before the task begins. The SSC is to confirm that permit spaces are properly posted or that employees are informed of their locations and hazards.

Refer to CH2M HILL SOP HS-203, Confined Space Entry, for additional information.

2.3.13 Backing Field Vehicles

The following precautions shall be implemented to prevent incidents during backing of field vehicles:

- Avoid backing whenever possible. The SC will be responsible for determining when "backing" is allowed. If extensive backing is required, alarms that sense when an object is close by must be used.
- If backing is required, there MUST BE a spotter. If a spotter is not available, the driver MUST walk completely around the vehicle before backing up.
- When "backing" is likely to be a part of the activities, it must be discussed in the daily safety briefings to remind staff of the hazards and controls.
- Learn your vehicle's blind spots.

2.3.14 Driving in Areas with Tall Grass/Brush

Driving in areas with tall grass/brush can present a potential fire hazard if the grass/brush gets caught under and/or remains in contact with the vehicle exhaust system. Employees should exercise the following precautions:

- When stopping vehicle, ensure it is in an area where grass is not tall.
- Do not leave vehicle idling once stopped.
- When possible, try to drive through areas where grass is not tall or grass has been beaten down.
- Ensure that a fire extinguisher is available for each vehicle.
- Keep fire extinguisher readily available in passenger area of vehicle while driving.
- Keep fire extinguisher outside of vehicle upon stopping.
- Address fire hazards and controls in daily safety briefings as appropriate.

2.3.15 Severe Weather

The following precautions should be taken in the event of severe weather:

- Identify "Take Shelter" areas before starting project.

  If it is necessary to seek shelter, notify the Project Manager and Client Representative.

- Work may proceed in light rain, although workers should wear rain gear.
- Exposure to slips, trips and falls is increased during rainy and snowing conditions.
- Take cover in field vehicle during adverse weather conditions (e.g., high winds, heavy rain, or lightning).
- Work shall cease and cover sought in the event of lightning or tornado warnings.

2.3.16 Working On or Near Water

The following precautions should be taken when working on or above water:

- Safe means of boarding or leaving the boat or platform must be provided to prevent slipping and falling.
- All persons participating in boating operations will be directed by the SSC.
- All personnel shall wear a Personal Flotation Device (PFD) at all times while on the water.
- The boating team will include at least one person qualified in First Aid.
- Team Leader has final authority on operations with regards to weather and water conditions
- All operations involving boating will be directed by qualified and experienced boater.
- If applicable, a Safe Boating Checklist will be completed at the frequency specified in Section 2 of this plan (and will be included in Attachment 5).
- Boat/barge must be equipped with adequate railing.
- Boat/barge must be operated according to U.S. Coast Guard regulations (speed, lightning, right-of-way, etc.).
- Staff should be instructed on safe use and operation of boat prior to use.
- Work requiring the use of a boat will not take place at night or during inclement weather.
- Shut off engine before refueling.
- Do not smoke while refueling.

- Fall protection should be provided to prevent personnel from falling into water. Where fall protection systems are not provided and the danger of drowning exists, U.S. Coast Guard-approved PFDs, or life jacket, shall be worn.
- Inspect PFDs prior to use. Do not use defective PFDs.
- A life-saving skiff must be provided for emergency rescue.
- A minimum of one ring buoy with 90 feet of 3/8-inch solid-braid polypropylene (or equal) rope must be provided for emergency rescue.
- Use sampling and other equipment according to the manufacturers' instructions.
- Refer to CH2M HILL HSE SOP-404, In-water, Wetland and Coastal Work, for additional information. sought in the event of lightning or tornado warnings.

2.3.17 Concrete and Masonry Construction

- Wear appropriate personal protective equipment (eye/face protection, gloves, rubber boots) when in areas where concrete is being poured.
- Protruding reinforcing steel (rebar), onto which personnel could fall, must be guarded to eliminate the hazard of impalement.
- Stay as clear as possible of all hoisting operations. Loads, including concrete buckets, shall not be hoisted overhead of personnel.
- Maintain a safe distance from formwork and shoring being removed from concrete structures.
- Maintain a safe distance from precast and lift-slab concrete being lifted into position until physically secured.
- Do not stand behind the tensioning jacks during post-tensioning.
- Do not ride concrete buckets.

Do not enter limited access zones during concrete or masonry wall construction.

2.1.18 Arsenic

- Do not enter regulated work areas unless training, medical monitoring, and PPE requirements established by the competent person have been met.
- Do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.
- Avoid skin and eye contact with liquid and particulate arsenic or arsenic trichloride.
- Arsenic is considered a “Confirmed Human Carcinogen.”
- Arsenic particulates (inorganic metal dust) are odorless. Vapor and gaseous odor varies depending upon specific organic arsenic compound.
- Respiratory protection and other exposure controls selection shall be based on the most recent exposure monitoring results obtained from the competent person.

2.4 Biological Hazards and Controls

2.4.1 Snakes

Each year, about 9,000 people are bitten by poisonous snakes in the U.S. Only about 15-25% actually receive venom, and U.S. deaths from snakebites only total about 12-15 people annually. In 2002, there were only 9 snakebite deaths in the US. Most snakebite deaths occur in small, young children whose lack of body mass and immune system development make them more susceptible to snake venom. However, a far larger number of people suffer medical complications ranging from mild to serious problems from improper treatment than the number who die. Therefore, knowing what to do to avoid snakebites, and how to properly treat them if they occur, is critical to preventing permanent injury or death.

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

Table 2-3 summarizes the measures to be taken (and NOT to be taken) in the event of a snakebite.

TABLE 2-3
Snakebite Response Measures

Things to Do	Things NOT to Do
• Move victim, and everybody else, away from snakes. • Identify the snake - kill it ONLY if necessary. • Lie the victim down with the bite area at or just slightly below the heart level. • Calm the victim by explaining the facts about snakebites. • Immobilize the bite area with a splint and sling, if possible. • Remove constricting jewelry or clothing unless the victim resists. • Get professional medical help as quickly as possible.	• Do not cut and suck the wound, either manually or orally. • Do not apply a tight, narrow band tourniquet - these cause amputations! • Do not apply ice or heat packs, and do not use a stun gun on the bite area. • Do not give the victim any food or drink, and this applies especially to alcohol! • Do not allow the victim to become alarmed, excited or agitated, as this will only increase blood flow and the chances of getting poison to the heart. • Do not allow victim to exercise vigorously, including running. • If you must kill the snake, then do NOT touch its head for at least one hour. If you must kill a snake for identification purposes, then completely remove its head and bury it. Snake heads have been documented as capable of biting and injecting poison an hour or more after decapitation.

	• Do not waste valuable time on unimportant acts like trying to find a snake to identify or kill it. Hemotoxic poison will start to enter the blood stream within 30 minutes, and neurotoxic poison works even faster.

Following the above protocols (Table 2-3) will greatly reduce the chances of serious complications from snakebites. Bear in mind that few people die from poisonous snakebites and the vast majority of snakebite victims are not even venomized. Snakes generally reserve their venom for prey they intend to eat. Snakebites are more a nuisance than a serious medical problem in most cases.

2.4.2 Poison Ivy and Poison Sumac

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention. Additional information and photographs of each are provided in Attachment 10.

2.4.3 Ticks

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing with permethrin or permanone and spray skin with only DEET; and check yourself frequently for ticks.

If bitten by a tick, grasp it at the point of attachment and carefully remove it. After removing the tick, wash your hands and disinfect and press the bite areas. Save the removed tick. Report the bite to human resources. Symptoms of tick-borne diseases include chills, fever, headache, fatigue, stiff neck, and bone pain. Other symptoms include:

- Lyme Disease - A rash might appear that looks like a bullseye with a small welt in the center.
- Rocky Mountain Spotted Fever – A rash of red spots may appear under the skin 3-10 days after the tick bite.

If any of these symptoms appear, seek medical attention.

2.4.4 Bees and Other Stinging Insects

Bee and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SSC and/or buddy. If a stinger is present, remove it carefully with tweezers.

Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

2.4.5 Bloodborne Pathogens

Exposure to bloodborne pathogens may occur when rendering first aid or cardiopulmonary resuscitation (CPR), or when coming into contact with landfill waste or waste streams containing potentially infectious material. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.

Refer to CH2M HILL HSE SOP-202, Bloodborne Pathogens, for additional information regarding exposure controls and PPE.

2.4.6 Mosquito Bites

Due to the recent detection of the West Nile Virus in the Southeastern United States it is recommended that preventative measures be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent.

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35%) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

Symptoms of Exposure to the West Nile Virus

The West Nile Virus incubation period is from 3-15 days. Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.

If you have any questions or to report any suspicious symptoms, contact the project HSM.

2.4.7 Spiders

Black Widow

Description

The female black widow spider is almost twice the size of its male counterpart. Although both are considered venomous, only the female spider is able to bite and envenomate humans. During the summer months, the female black widow spider is the most venomous. The spider undergoes multiple moltings throughout the year and often changes color. The female is most often shiny black in color and has a rounded abdomen with a red distinctive hourglass on its ventral surface. Occasionally, two red spots may be seen instead of the hourglass configuration.

Symptoms

When bitten by a black widow spider, the symptoms usually begin with a pinprick sensation, followed by the appearance of mild swelling and redness around the bite wound. It is not unusual for the patient to be unaware of the bite until a local reaction has occurred. Close evaluation of the site may reveal two fang marks. The first hour after the bite, pain often increases around the area of the bite and spreads to the entire body. Upper extremity bites usually lead to spasm of the upper trunk muscles; bites of the lower extremity often lead to abdominal spasms.

Other common symptoms include an abnormal sensation in the extremities (i.e., prickling or burning), deep tendon reflexes, headache, anxiety, nausea, vomiting, tremor, restlessness, and seizures may also be seen. Symptoms usually resolve within 24-48 hours

General treatment includes local wound care, a tetanus shot, and pain medication if needed. Airway, breathing, and circulation should be monitored closely.

Prevention

Wear gloves, heavy garments that are fully buttoned, and protective footwear when working in areas where spiders commonly inhabit (i.e., dark and protected spaces such as wells, rock and wood piles, pipes, gloves, boots, etc.)

Brown Recluse

Description

The brown recluse spider is approximately 1 centimeters (cm) in body length, with a leg span of up to 2.5 cm. The color of these spiders is usually tan to brown.

Symptoms

Envenomation is initially painless for most victims. Within the first few hours, pain and redness occur at the site of the bite. The bite mark may resemble a bullseye and is most often 1-5 cm in diameter. Over the next few days, the bite area will ulcerate and spread in diameter and into the fatty tissue below. In one week after the bite a large area of skin and tissue can be involved. Surgical intervention is usually required to remove the bite area.

Systemic reactions, while uncommon, can occur in some individuals. These symptoms usually occur within 2 days of the bite and can include fever, chills, rash, nausea, vomiting, and possible renal failure.

General treatment includes local wound care, tetanus inoculation, immobilization, elevation, observation, and surgical removal of the wound.

Prevention

Wear gloves, heavy garments that are fully buttoned, and protective footwear when working in areas where spiders commonly inhabit (i.e., dark and protected spaces such as wells, rock and wood piles, pipes, gloves, boots, etc.)

Additional information regarding spiders can be found in Attachment 10.

2.5 Chemicals of Potential Concern

Table 2-4 summarizes information pertaining to chemicals of potential concern (COPCs) at the project site.

TABLE 2-4
Chemicals of Potential Concern Summary Table

Contaminant [a]	Impacted Media [b]	Maximum Conc(s) [c]	Exposure Limit [d]	IDLH [e]	Symptoms and Effects of Exposure	PIP [f] (eV)
Arsenic (Ca)	GW Surface Soil	760 mg/l 2,200 ppm (max)	0.01 mg/m^3	5 mg/m^3	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA

Notes:

[a] "Ca" = potential occupational carcinogen.

[b] Specify all impacted media to which site workers may be exposed using the following definitions:

A (Air)	SB (Soil)	SW (Surface Water)
D (Drums)	SL (Sludge)	TK (Tank)
GW (Groundwater)	SV (Soil Vapor)	

[c] The maximum concentrations detected at the site for each media of concern.

[d] The lower of the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) is listed. Values are given in parts per million (ppm) or milligrams per cubic meter (mg/m^3).

[e] IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); ND = Not determined.

[f] PIP = photoionization potential; NA = Not applicable; UK = Unknown.

Workers may also be exposed to chemicals used during sampling and remediation activities. MSDSs are required for all virgin (i.e., non-contaminant) chemicals brought to the site. These MSDSs are presented as Attachment 8.

A summary of the personal protective equipment required to minimize exposure to environmental contaminants and virgin chemicals is presented in Section 4.

2.6 Potential Routes of Exposure

Potential routes of exposure include the following:

- **Dermal:** Skin contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Personal Protective Equipment Section of this plan.
- **Inhalation:** Inhalation of vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in the PPE and Air Monitoring/Sampling Sections of this plan, respectively.
- **Ingestion:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

3.0 Roles and Responsibilities

3.1 CH2M HILL Staff Responsibilities

3.1.1 Project Manager

The CH2M HILL project manager (PM) is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HS&E management process. The PM has overall management responsibility for the tasks listed below. The PM may delegate specific tasks to other staff, as described in sections that follow, but retains ultimate responsibility for completion of the following in accordance with this HS&E Plan:

- Incorporate standard terms and conditions, and contract-specific HS&E roles and responsibilities in the contract with the client.
- Budget for the appropriate level of HS&E oversight during field activities. Contact the HSM for budget requirements and guidelines.
- Manage the site and interface with third parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care.
- Ensure that the overall, project-specific HS&E goals are fully and continuously implemented.
- Ensure that CH2M HILL's SC is completing all duties outlined in this HS&E Plan.
- Promoting a safety culture with onsite CH2M HILL personnel and setting the example for safe behavior.

The PM has the following additional responsibilities when subcontractors are hired:

- Incorporate standard terms and conditions, and contract-specific HS&E roles and responsibilities in subcontract agreements (including flow-down requirements to lower-tier subcontractors).
- Select safe and competent subcontractors by implementing the CH2M HILL Subcontractor Management Program. This program includes the review of subcontractor pre-qualification questionnaires, training and medical monitoring records, and site-specific safety procedures prior to the start of subcontractor's field operations.
- Ensure that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award.
- Maintain copies of subcontracts and subcontractor certificates of insurance, bond, contractor's license, training and medical monitoring records, and project-specific HS&E procedures in the project file accessible to site personnel.

- Provide adequate oversight of subcontractor HS&E practices per the HS&E Plan.

3.1.2 Project Health and Safety Manager

The CH2M HILL Project Health and Safety manager (HSM) is responsible to:

- Support the SC's oversight of HS&E practices and interfaces with onsite third parties per the HS&E Plan.
- Conduct audits, as necessary, to assess site conditions and review HS&E program implementation.
- Assist the PM with HS&E budget guidelines.
- Assist with program implementation as needed.

The HSM has the following additional responsibilities when subcontractors are hired:

- Ensure that subcontractor pre-qualification questionnaires are reviewed and assist as applicable in the acceptance or rejection.
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations.
- Support the SC's oversight of subcontractor's (and lower-tier subcontractor's) HS&E practices per the HS&E Plan.

3.1.3 Safety Coordinator

The Safety Coordinator (SC) shall be onsite for the duration of onsite work and is responsible for verifying that the project is conducted in a safe manner including the following obligations:

- Verify that this HS&E Plan is current and amended when project activities or conditions change.
- Verify that CH2M HILL site personnel and subcontractors read this HS&E Plan and sign the CH2M HILL Employee Sign-Off Form included in Attachment 1.
- Verify compliance with the requirements of this HS&E Plan, applicable contractor health and safety plan(s) and any federal, state, and local regulations.
- Review and understand contractual obligations regarding HS&E roles and responsibilities.
- Manage the site and interfacing with third parties in a manner consistent with our contract/subcontract agreements and the applicable standard of reasonable care.
- Ensure that programs are effectively functioning to prevent and control hazards on the project.
- Verify that all CH2M HILL employees working in the field have the appropriate level of HS&E training, medical surveillance, and drug and alcohol testing for their job duties

including required specialty training (e.g., fall protection, confined space entry) identified in the Hazard Controls and Safe Work Practices Section of this HS&E Plan.

- Conduct an HS&E orientation for all CH2M HILL team members prior to entering the project work areas and deliver field HS&E training as needed based on project-specific hazards and activities.
- Maintain active and visible involvement using open communication with employees regarding safety issues on the project.
- Verify that safety meetings are conducted and document in the project file as needed throughout the course of the project (e.g., as tasks or hazards change).
- Attend Contractor safety meetings and ask questions about access to work areas, safety hazards, precautions and other general safety issues.
- Post required information onsite. An Occupational Safety and Health Administration (OSHA) job-site poster is required at sites where project field offices, trailers, or equipment-storage boxes are established. Contact the HSM for posters.
- Maintain HS&E records and documentation.
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in the Hazard Communication section of this HS&E Plan.
- Act as the project "Emergency Response Coordinator" and perform the responsibilities outlined in the Emergency Preparedness section of this HS&E Plan.
- Verify that project HS&E forms, permits and self-assessment checklists are being used as outlined in this plan.
- Ensure that the Drug Testing Hospital Kit is available onsite in the event of a serious injury involving hospital, ambulance, or paramedic care. The hospital kit must accompany the injured employee to the hospital so they will get drug tested. For additional information on the Drug Testing Hospital Kits, refer to Attachment 11.
- Verify appropriate PPE use, availability, and training.
- Inform the HSM of any project incident, ensure that an Incident Report Form (IRF) is completed and conduct incident investigations as outlined in the Incident Reporting and Investigation section of this HS&E Plan.
- Facilitate OSHA or other government agency inspections including accompanying inspector and providing all necessary documentation and follow-up.
- Report all incidents to the HSM and/or the Honeywell HSPM immediately. Depending on the type and severity of incident, we may have to report it to Honeywell within hours of occurrence. The Honeywell HSPM will determine what needs to be reported, the timing of the reporting, and coordinate client notification so local and Corporate Honeywell personnel are appropriately notified.

The SC has the following additional responsibilities when subcontractors are hired:

- Verify that project files available to site personnel include copies of executed contracts and certificates of insurance; bond; contractors license; training, medical monitoring, and drug and alcohol testing records; and project-specific HS&E procedures prior to start of subcontractor's field operations.
- Verify that ongoing training, medical monitoring, and drug and alcohol testing requirements are being met (e.g., 8-hour refresher, random drug testing programs, etc).
- Perform oversight and/or assessments of subcontractor HS&E practices per this HS&E plan and verify that project activity self-assessment checklists have been completed (Attachment 5).

3.1.4 CH2M HILL Employees

All personnel are assigned responsibility for safe and healthy operations. This concept is the foundation for involving all employees in identifying hazards and providing solutions. For any operation, individuals have full authority to stop work and initiate immediate corrective action or control. In addition, each worker has a right and responsibility to report unsafe conditions/practices. This right represents a significant facet of worker empowerment and program ownership. Through shared values and a belief that all accidents are preventable, our employees accept personal responsibility for working safely. Each employee is responsible for the following:

- Perform work in a safe manner without injury, illness or property damage.
- Perform work in accordance with company policies, and report near misses, injuries, illnesses, and unsafe conditions.
- Report all incidents, include near misses, immediately to supervisor, and file proper forms with a human resources representative. Contact your HS&E Manager and the Honeywell HSPM to ensure client reporting procedures are met. It is important to do incident notification immediately because, depending on the type of incident, we may be required to report to Honeywell within hours of the event.
- Report all hazardous conditions and/or hazardous activities immediately to a supervisor for corrective action.
- Intervene when an unsafe behavior and/or condition is observed.
- Complete an HS&E orientation prior to being authorized to enter the project work areas.
- Inspect assigned PPE to ensure the absence of defects and proper function.

3.2 CH2M HILL Employee Medical Surveillance, Training, & Drug Testing

Employees assigned to this project will have the following minimum training.

- 40-hour hazardous waste operations training

- 3-day on-the-job experience
- 8-hour annual hazardous waste refresher training.
- Employees who are in an onsite supervisor role will complete 8 hours of hazardous waste supervisor training
- Drug-Free Workplace training (when drug testing is required)
- Honeywell Program orientation
- Site-specific training/orientation

Employees designated as SC will also have completed a 12-hour safety coordinator course. The safety coordinator training course meets the requirements of 29 CFR 1910.120 for on-site supervisor training. Additionally, the SC shall have completed the CH2M HILL internal SC-Construction training course. An SC must be present during all tasks performed in exclusion or decontamination zones.

The SC and additional designated employees, as necessary, will be certified in first aid and CPR by the American Red Cross, or equivalent. At least one first aid/CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training. Additional training requirements are addressed in the specific hazard sections of this plan.

Employees who perform work activities in the decontamination or exclusion zone shall be enrolled in and have a current medical clearance as required by the medical surveillance program for hazardous waste workers.

Pregnant employees shall consult with the Corporate Consulting Physician prior to performing site activities and obtain a physician's statement of the employee's ability to perform hazardous activities before being assigned fieldwork.

Drug testing is required for CH2M HILL site workers who engage in certain activities at Honeywell sites (e.g., activities involving heavy equipment or drill rigs). Employees who conduct fieldwork may be required to pass an initial 5-panel drug screen and an alcohol screen two weeks prior to starting field activities. These staff will also be required to enroll in a random testing program for the duration of their work on Honeywell, and will be subject to post-incident and "for cause" testing. Contact the HSM to determine if drug testing is required**. For the scope of work presented in this plan, drug testing is not required for CH2M HILL staff. If site conditions change and/or additional tasks are added, contact the HSM to determine drug and alcohol testing requirements.**

Based on specific work activities/tasks, subcontractor personnel may be required to be drug and alcohol screened prior to conducting their field activities. Please contact the Health and Safety Program Manager (HSPM) for details and to determine if subcontractor personnel require drug testing. **For this project drug/alcohol testing will be required for all subcontractor and lower tier contractor company employees.**

Refer to CH2M HILL HSE SOP-113, Medical Surveillance, SOP-110, Training, and SOP-105, Drug-Free Workplace, for additional information.

3.3 CH2M HILL Subcontractors

The table(s) below list the name of each subcontractor, the subcontractor safety representative, and a description of the subcontracted activities to be performed at the site.

Subcontractor	TBD
Subcontractor Safety Rep	
Subcontractor Onsite Tasks	

Subcontractor	TBD
Subcontractor Safety Rep	
Subcontractor Onsite Tasks	

This section to be revised after contractor is selected.

The subcontractors listed above are covered by this HS&E Plan and must be provided a copy of this document. However, this plan does not address hazards associated with the tasks and equipment for which the subcontractors have been engaged (e.g., drilling, excavation work, electrical). Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit these procedures to CH2M HILL for review before the start of field work. Subcontractors must comply with all established health and safety plan(s) for this project. The CH2M HILL SC should verify that subcontractor employee training, medical clearance, and fit test records are current and must monitor and enforce compliance with the established HS&E Plan(s). CH2M HILL's oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

CH2M HILL team members should endeavor to observe subcontractors' safety performance. This endeavor should be reasonable, and include observation of hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. The SC is responsible for confirming subcontractor performance against both the subcontractor's task specific safety procedures and applicable self-assessment checklists, as provided in Attachment 5.

HS&E related communications with CH2M HILL subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the CH2M HILL HS&E Plan Employee Sign-Off Form, included in Attachment 1.
- Request subcontractor(s) to brief project team on the hazards and precautions related to their work.
- When non-compliant or unsafe conditions or practices are observed, notify the subcontractor safety representative and require corrective action—the subcontractor is responsible for determining and implementing necessary controls and corrective actions.
- When repeat non-compliant or unsafe conditions are observed, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented.
- When an apparent imminent danger exists, immediately remove all affected personnel, notify subcontractor safety representative, stop affected work until adequate corrective measures are implemented, and notify the Project Manager, HSM, and SC as appropriate.
- Document all verbal HS&E related communications in project field logbook, daily reports, or other records.

Subcontractors are responsible to:

- Comply with all local, state, and federal HS&E standards; and project/owner HS&E requirements.
- Provide a qualified subcontractor safety representative (SSR) to oversee the subcontractor activities and conduct safety inspections for their work.
- Conduct site-specific orientations for all subcontractor employees.
- Actively participate in the project HS&E program and attend all required safety meetings.
- Meet training, medical monitoring, and drug and alcohol testing requirements for their staff.
- Intervene when they observe unsafe behaviors and/or conditions.
- Maintain equipment and supplies necessary to complete activities in a safe manner.
- Notify the CH2M HILL SC of any injury or incident, including near-misses, immediately and submit reports to CH2M HILL within 24 hours. Additionally, all incidents must be reported to the HSM and Honeywell HSPM immediately so we can meet Honeywell's incident reporting requirements.

Refer to CH2M HILL HSE SOP-215, Contracts, Subcontracts, and HSE Management Practices, for additional information.

3.4 Third Parties

The table(s) below list the name of each third party, the third party safety representative, and a description of the third party activities being performed at the site which have the potential to impact CH2M HILL's activities.

Third Party	Maryland Department of Transportation
Third Party Safety Rep	TDB
Third Party Onsite Tasks	Site Visits

This HS&E Plan does not cover parties who do not have a contractual relationship with CH2M HILL. CH2M HILL is not responsible for the health and safety or means and methods of a third party's work, and we must never assume such responsibility through our actions (e.g., advising on HS&E issues). In addition to this plan, CH2M HILL staff should review third parties' safety plans so that we remain aware of appropriate precautions that apply to us. Except in unusual situations when conducted by the HSM, CH2M HILL must never comment on or approve a third party's safety procedures. Self-assessment checklists, provided in Attachment 5, are to be used by the SC to review the third party's performance ONLY as it pertains to evaluating CH2M HILL employee and subcontractor exposure and safety.

HS&E related communications with third parties should be conducted as follows:

- Request the third party to brief CH2M HILL employees and subcontractors on the precautions related to the contractor's work.
- When an apparent third party's non-compliant or unsafe condition or practice poses a risk to CH2M HILL employees or subcontractors:
  - Notify the third party's safety representative
  - Request that the third party determine and implement corrective actions
  - If needed, stop affected CH2M HILL work until the third party corrects the condition or practice. Notify the client, Project Manager, and HSM as appropriate.
- If apparent third party's non-compliant or unsafe conditions or practices are observed, inform the third party's safety representative. CH2M HILL's obligation is limited strictly to informing the third party of the observation – the third party is solely responsible for determining and implementing necessary controls and corrective actions.
- If an apparent imminent danger is observed, immediately warn the third party's employee(s) in danger and notify the third party's safety representative. CH2M HILL's obligation is limited strictly to immediately warning the affected individual(s) and

informing the third party of our observation – the third party is solely responsible for determining and implementing necessary controls and corrective actions.

- Document all verbal HS&E related communications in project field logbook, daily reports, or other records.

Refer to CH2M HILL HSE SOP-215, Contracts, Subcontracts, and HSE Management Practices, for additional information.

4.0 Personal Protective Equipment

The PPE hazard assessment performed by the HSM requires the following PPE for use during site activities. The PPE required by the table will be evaluated periodically by the SC to ensure the adequacy based on air monitoring results or changes to expected site conditions. The SC shall coordinate all changes with the HSM. Refer to CH2M HILL HSE SOP-117, Personal Protective Equipment, and SOP-121, Respiratory Protection, for additional information.

4.1 PPE Specifications

PPE requirements for the project are summarized in Table 4-1.

Table 4-1 PPE Specifications [a]

Task	Level	Body	Head	Respirator [b]
Site Visits, contractor oversight Contractor redevelopment activities -	D	Work clothes; steel-toe, leather work boots; work gloves and safety vest.	Hardhat [c] Safety glasses Ear protection [d]	None required
Confirmatory soil sampling Contractor entering arsenic impacted excavation/trench without marker fabric Contractor placing or working with cement/concrete	Modified D	Coveralls: Uncoated Tyvek® may be necessary if contact with subsurface materials or cement/concrete cannot be controlled Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boot with boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves. Rubber gloves worn by contractor working with cement-concrete	Hardhat [c] Splash shield [c] Safety glasses Ear protection [d]	None required
Activities that cause a need to upgrade	C	Coveralls: Polycoated Tyvek® Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Splash shield [c] Ear protection [d] Spectacle inserts	APR, full face, with P100 filter cartridges.
None anticipated	B	Coveralls: Polycoated Tyvek® Boots: Steel-toe, chemical-resistant boots OR steel-toe, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Splash shield [c] Ear protection [d] Spectacle inserts	Pressure demand supplied air respirator with escape bottle or Pressure demand SCBA

Notes:
[a] CH2M HILL will provide PPE only to CH2M HILL employees.
[b] No facial hair that would interfere with respirator fit is permitted.
[c] Hardhat and splash-shield areas are to be determined by the SC.
[d] Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.
[e] Cartridge change-out schedule will be established by the HSM and at a minimum shall be at least every 8 hours (or one work day), except if relative humidity is > 85%, or if organic vapor measurements are > midpoint of Level C range (refer to Section 5)--then at least every 4 hours. If encountered conditions are different than those anticipated in this HS&E Plan, contact the HSM.

4.2 Reasons for Changing Level of Protection

Reasons for upgrading or downgrading the level of PPE are provided below.

4.2.1 Upgrade

Potential reasons for upgrading PPE level are listed below. ***Note: Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SC qualified at that level is present.***

- Request from individual performing tasks.
- Change in work tasks that will increase contact or potential contact with hazardous materials.
- Occurrence or likely occurrence of gas or vapor emission.
- Known or suspected presence of dermal hazards.
- Instrument action levels (Section 5) exceeded.
- Cannot control contact with subsurface materials

4.2.2 Downgrade

Potential reasons for downgrading PPE level are listed below.

- New information indicating that situation is less hazardous than originally thought.
- Change in site conditions that decreases the hazard.
- Change in work task that will reduce contact with hazardous materials.

5.0 Air Monitoring/Sampling

Air monitoring and sampling must be performed to verify that our employees are not be exposed to harmful levels of airborne contaminants and that airborne contaminants are not migrating into public areas.

Refer to CH2M HILL SOP HSE-207, *Exposure Assessment for Airborne Chemical Hazards*, for additional information

5.1 Air Monitoring Specifications

Air monitoring specifications are summarized in Table 5-1

TABLE 5-1
Air Monitoring Specifications

Instrument	Tasks	Action Levels [a]	PPE or Action Required	Frequency [b]	Calibration
Dust Monitor: Miniram model PDM-3 or equivalent Upwind and downwind locations	During all work tasks	0 – 0.9 mg/m3 > 0.9 mg/m3	Level D Level C	Continuously through duration of project	Zero Daily
Noise Level SC shall determine when hearing protection is warranted	All	Conversation can held at distances of 3 feet without raising voice If voice has to raised to hear	No action Hearing protection (Heavy equipment operations)	Continuously through duration of project	NA

Notes:
[a] Action levels apply to sustained breathing-zone measurements above background.

[b] The exact frequency of monitoring depends on field conditions and is to be determined by the SC; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3," "at surface/SB-2," etc.).

[c] If the measured percent of O_2 is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O_2 action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry (refer to Section 2).

[d] Refer to SOP HSE-604 for instructions and documentation related to radiation monitoring and screening.

[e] Noise monitoring and audiometric testing also required.

5.2 Calibration

Instruments will be function tested in accordance with the respective manufacturer's instructions for proper instrument use and maintenance. The instrument vendor or the CH2M HILL warehouse staff will ensure equipment has been calibrated in accordance with manufacturer's specifications.

All direct reading instruments will be function tested daily by the SC using span gas, prior to performing work activities and after the completion of the daily activities.

5.3 Air Sampling

Sampling, in addition to real-time monitoring, may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, beryllium, hexavalent chromium, benzene, methylene chloride, vinyl chloride and certain volatile organic compounds. Air sampling methods will be National Institute for Occupational Safety and Health (NIOSH) or OSHA-certified and samples analyzed by a laboratory that is accredited by the American Industrial Hygiene Association (AIHA) for the compound specific method.

Personal air sampling will not be conducted at this time. If site conditions change the HSM may modify this HASP to require the need for such sampling and analysis.

Perimeter air sampling for arsenic will be conducted in accordance with the Air Sampling Plan presented in Attachment 13. The HSM shall interpret all air sampling results and modify the requirements of this HSE plan, based on the interpretation.

Air sampling calibration, documentation, and chain-of-custody will be documented on appropriate forms that will be supplied by the HSM and/or laboratory being used for analysis.

6.0 Decontamination

The SC must establish the specific decontamination procedures for the specific site tasks. The SC must monitor the decontamination procedures, and should modify any procedures found to be ineffective. The SC must ensure that procedures are established for disposing of materials generated on the site.

Refer to CH2M HILL HSE SOP-218, Hazardous Waster Operations - Decontamination, for additional information.

6.1 Decontamination Requirements

Possible decontamination procedures are provided in Section 6.1.

TABLE 6-1
Possible Decontamination Procedures

Personnel	Sample Equipment	Heavy Equipment
• Boot wash/rinse • Glove wash/rinse • Outer-glove removal • Body-suit removal • Inner-glove removal • Respirator removal • Hand wash/rinse • Face wash/rinse • Shower • Disposal of PPE in municipal trash, or containment for disposal • Disposal of personnel rinse water to facility or sanitary sewer, or containment for offsite disposal	• Wash/rinse equipment • Solvent-rinse equipment • Contain solvent waste for offsite disposal	• Power wash • Steam clean • Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

6.2 Diagram of Personnel Decontamination Line

Figure 6-1 illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SC to accommodate task-specific requirements. No eating, drinking, or smoking is permitted in contaminated areas or in exclusion and decontamination zones. The SC should establish areas for these activities.

6.3 Collection and Disposal of Decontamination Wastes

Contaminated materials, PPE, and fluids shall be managed according to waste management procedures specified in the project Work Plan. If no such guidance is available, please contact the ECC for additional information and procedures.

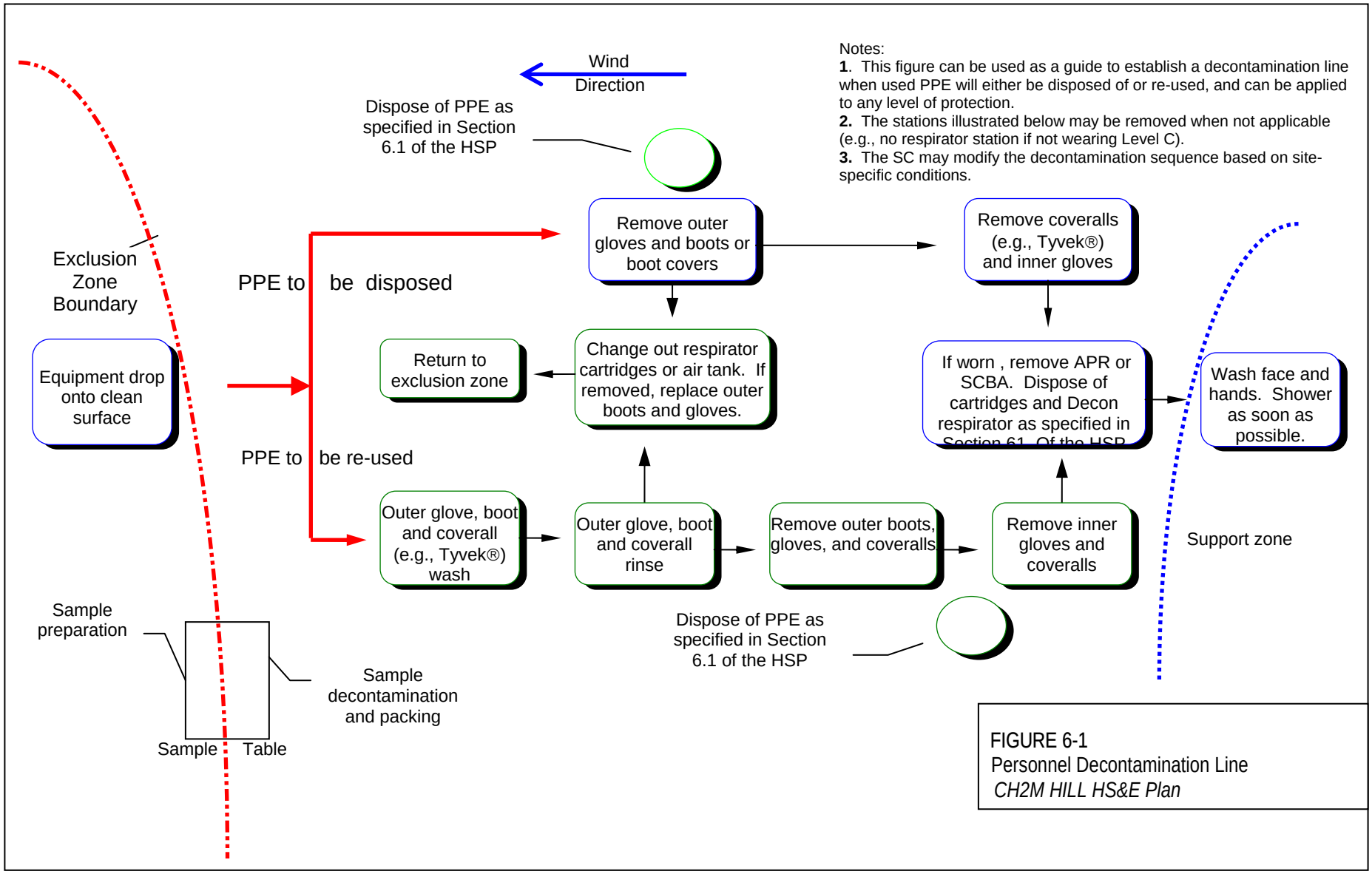


FIGURE 6-1
Personnel Decontamination Line
CH2M HILL HS&E Plan

7.0 Spill Containment and Notification

This section describes spill containment and notification requirements.

7.1 SPCC Regulated Facility

If the client facility is subject to a Spill Prevention, Control and Countermeasures (SPCC) Plan, a copy must be obtained and all spill prevention and response must conform to client SPCC requirements. If the client does not have an SPCC Plan and the project requires storage of more than 1,320 gallons of petroleum in 55-gallon containers or greater, a project-specific SPCC plan will be prepared.

7.2 Non-SPCC Regulated Facility

Projects not subject to SPCC requirements shall comply with this section. All onsite personnel shall be trained to follow the procedures described in this section.

7.2.1 Equipment

Field staff should obtain client approval for use of client-owned spill containment equipment. If client equipment is not available, the minimum spill equipment that shall be made available in the project's support zone is described in Table 7-1. Additional contaminant-specific spill response information may be included in the chemical MSDS.

TABLE 7-1
Minimum Spill Kit Equipment List

Spill Kit Contents
• Absorbent material (kitty litter or vermiculite)
• Neutralizers (for chemical spills)
• Absorbent socks and pads
• Safety Goggles
• Protective Gloves
• Tyvek Suit
• Waste Containers and Labels

7.2.2 Emergency Spill Event

The release of an unknown hazardous material is considered an emergency spill event. Implement the following procedures during an emergency spill event:

1. Evacuate the area and go upwind

2. Warn others and direct them upwind
3. Immediately contact the onsite Safety Coordinator who will contact the HSM for direction

7.2.3 Non-Emergency Spill Event

A non-emergency spill event includes incidental releases that do not pose a significant safety or health hazard where chemical hazards are known and CH2M HILL personnel can safely implement the following procedures as a first responder:

1. Stop the source of the spill
2. Contain the spill material. If there is a chance the spill will reach nearby drains or waterways, block them off to keep the spill away
3. Contact the onsite Safety Coordinator

7.2.4 Cleanup

Clean up the spilled material wearing the proper PPE identified in the HS&E Plan equipment table if the spilled material is less than 5 gallons and hazards are known. Spills larger than 5 gallons must be cleaned up by a qualified subcontractor since CH2M HILL personnel are not trained to implement OSHA spill response requirements. Dispose of spill debris according to the Waste Management Plan or as directed by the ECC.

7.2.5 Notification and Reporting

All spills are considered an "incident" and shall be reported internally according to procedures in HSE SOP-111, Incident Reporting and Investigation. Since many spills may require agency reporting within 24 hours, it is very important that internal notification occur immediately. The following summarizes required actions:

1. ***Immediately*** notify the onsite Safety Coordinator
2. SC notifies the HSM
3. HSM notifies the PM, who notifies the client
4. HSM notifies the Legal Department of a serious incident
5. HSM, ECC, and client shall determine if the incident is reportable to an agency

8.0 Site-Control Procedures

The following site control procedures shall be implemented at the site:

- All site visitors shall be director to the field office trailer for sign in/out process and to receive site orientation training. Visitors shall be escorted throughout their visit and remain out of all exclusion and contamination reduction zones. Required PPE shall be made available to all site visitors.
- The SC will conduct a site safety briefing before starting field activities or as tasks and site conditions change.
- Topics for the site safety briefing include general discussion of the HS&E plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, and emergencies.
- The SC will record attendance at safety briefings in a logbook and document the topics discussed.
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Initial air monitoring shall be conducted by the SC using an appropriate level of PPE.
- The SC is to conduct periodic inspections of work practices to determine the effectiveness of this plan. Deficiencies are to be noted, reported to the HSM, and corrected.

Refer to CH2M HILL HSE SOP-510, Site Control, for additional information.

9.0 Hazwoper Compliance Plan

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks (Section 1.3.1) might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities specified in Section 1.3.2 do not require 24- or 40-hour training. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site, or while non-Hazwoper-trained staff are working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to subsections 2.5 and 5.3 for contaminant data and air sampling requirements, respectively.
- When non-Hazwoper-trained personnel are at risk of exposure, the SC must post the exclusion zone and inform non-Hazwoper-trained personnel of the:
  - Nature of the existing contamination and its locations
  - Limitations of their access
  - Emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-Hazwoper-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-Hazwoper-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.
- Procedures for remediation treatment system start-ups are as follows: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the Hazwoper standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only Hazwoper-trained personnel (minimum of 24 hour of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must not enter the TSDF area of the site.

Refer to CH2M HILL HSE SOP-220, Site-Specific Written Safety Plans, for additional information.

10.0 Incident Reporting and Investigation

This section describes the notification and investigation requirements pertaining to a site incident. Refer to CH2M HILL HSE SOP-111, Incident Reporting and Investigation, for additional information.

10.1 Definitions

10.1.1 Incident

An incident is an undesired event that results or could have resulted in an injury, illness, damage to assets or environment harm. The following events shall be considered incidents:

- Injury or illness to a CH2M HILL/OMI employee or CH2M HILL/OMI subcontractor employee
- Injury or illness to a third party that was caused by a CH2M HILL/OMI activity
- Hazardous substance exposure
- Damage to property or equipment
- Motor vehicle accident
- Fire or explosion
- Spill or release
- Environmental issue permit violation
- A "near-miss"

10.1.2 Near-Miss

A near-miss occurs when an intervening factor prevented an injury, damage to property, or environmental harm from occurring. Examples of near-miss situations include: a hard hat or other personal protective equipment (PPE) prevented an injury; secondary containment or emergency shutoff prevented a spill; or an alert co-worker prevented an accident.

10.1.3 Serious Incidents

The HSM and Legal and Insurance Department (LID) shall determine if an event should be considered as a serious incident after reviewing the initial incident facts. The general criteria for serious incidents include:

- Intervention by external emergency response organizations
- Hospitalization
- Spills and releases of hazardous substances exceeding the reportable quantity (RQ)

- Potential violations of law or regulation
- Estimated property damage in excess of $10,000

10.2 Injury Reporting

- If a CH2M HILL employee is injured immediately notify their group leader.
- Call the CH2M HILL Occupational Health Nurse

1-800-756-1130

- In case of emergency call 911.

If a serious incident and the HSM can not be reached, immediately call the 24-hour CH2M HILL emergency beeper number (720-286-4911).

Immediate reporting is critical because there are certain types of incidents that must be reported to Honeywell within hours of occurrence. The PHSM (Bill Berlett) will help the team determine what needs to be reported to Honeywell, how quickly it needs to be reported to Honeywell, and who at Honeywell (local, corporate, etc) needs to be notified, etc.

Incident communications regarding serious incidents (regardless of the party involved) shall be considered sensitive in nature and must be controlled in a confidential manner. Internal communications regarding a serious incident may be conducted with affected project, regional, and Business Group staff but must be kept to a minimum. Communication should be oral whenever possible. If e-mail communications are necessary they shall be sent as confidential emails following the procedure provided in section 6.2.2 of the *Incident Reporting and Investigation* SOP (HSE-111). A LID representative shall direct all internal and external communications, including internal incident reporting, agency reporting, client notification, and incident investigations.

10.3 Incident Notification and Reporting

- Upon any other project incident (fire, spill, , near miss, death, etc.), immediately notify the PM and HSM. Call emergency beeper number if HSM is unavailable.
- Notify and submit reports to client as required in contract.
- Serious Incidents must be reported in accordance with CH2M HILL Standard of Practice, *Serious Incident Reporting Process,* immediately. Serious incidents are those that involve any of the following:
  - Work related death, or life threatening injury or illness of a CH2M HILL employee, subcontractor, or member of the public
  - Kidnap/missing person
  - Acts or threats of terrorism
  - Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than $ 500,000 in damage.

Spill or release of hazardous materials or substances that involves a significant threat of imminent harm to site workers, neighboring facilities, the community or the environment

The PM/PHSM shall ensure that the incident is entered into Honeywell's event tracking system and that the CH2M HILL Incident Report Form (IRF) is completed within 24 hours of any incident. CH2M HILL's requirements can be met by entering an electronic IRF directly into the IRF database. The electronic IRF is found on the CH2M HILL HSE web page under Tools and Forms>Electronic Tools and Forms. If unable to submit an IRF electronically, the SC shall complete the hardcopy IRF provided in Attachment 7 and fax the IRF to the human resources representative (for CH2M HILL employee injuries) or the HSM (for all other incidents) for database entry. A copy of the hard-copy form should also be sent to PHSM. **An IRF for a serious incident shall not be initiated until directed by a representative of the LID.**

When additional or updated information becomes available that was not included in the original IRF the SC shall forward such information to the human resources representative (for CH2M HILL employee injuries) or the HSM (for all other incidents) so that the IRF may be updated. Updates to IRF reports should also be sent to PHSM.

CH2M HILL staff shall comply with all applicable statutory incident reporting requirements such as those required by Federal agencies (EPA, OSHA, etc.) and local authorities (police).

10.4 Incident Investigation

Incident investigations are to be initiated and completed as soon as possible, but no later than 72 hours after the incident has occurred. The level and type of investigation will be determined by Honeywell and PHSM. **All serious incidents shall be investigated as directed by a representative of the LID.** The HSM/ECC may conduct the investigation directly or may delegate this function to the SC or other party, depending on the extent of the incident and staff availability.

When it is determined that the investigation will be lead by the SC, the Incident Investigation Guideline provided in Attachment 7 shall be followed. Typically, minor incident investigations will be completed by the HSM/ECC by including the investigation facts in the IRF. The HSM/ECC may require completion of a separate investigation report or the Root Cause Analysis Form for more extensive investigations. The HSM/ECC shall ensure that the PM and SC are made aware of investigation findings and all corrective actions, and shall verify that corrective actions are implemented to prevent further incidents.

10.5 Corrective Actions

All corrective actions recommended from the incident investigation report shall be taken to prevent recurrence of the incident. The PM or SC should hold a review meeting to discuss the incident and the corrective actions. The responsible supervisors shall be assigned to carry out the corrective actions and shall inform the SC upon successful implementation of all corrective actions.

11.0 Emergency Preparedness

An emergency may be an injury to a worker, an explosion, evacuation, fire, or chemical release. Employees must know what to do if an emergency occurs. This requires pre-planning and communication of these plans to employees.

Refer to CH2M HILL HSE SOP-106, Emergency Planning, for additional information.

11.1 Pre-Emergency Planning

The SC shall perform the following pre-emergency planning tasks before starting field activities and coordinate emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate.

- Coordinate with property owner and/or review the facility emergency and contingency plans where applicable. Have a copy readily available at the site for review and attach a copy to this HS&E Plan.
- Complete and post the Emergency Contacts form provided in the front matter of this document. The SC should confirm that all information provided on the Emergency Contacts form is accurate and appropriately updated.
- Confirm and post evacuation routes, assembly areas and route to hospital.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn)
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone)
- Communicate emergency procedures to all field staff prior to field activities.
- Post "Exit" signs above exit doors and post "Fire Extinguisher" signs above locations of extinguishers in field trailers.
- Keep areas near exits and extinguishers free of obstructions.
- Designate one vehicle as the emergency vehicle, place hospital directions and map inside, and keep keys in ignition during field activities
- Where appropriate and acceptable to the client, inform emergency room and external emergency response organizations of anticipated types of site emergencies.
- Rehearse the emergency response plan before site activities begin, including driving the route to the hospital.
- Emergency drills should be performed periodically, but at least once per year. Upon completion of each drill, the SC shall evaluate the effectiveness of the emergency plan.

Any problems or concerns identified during the evaluation must be corrected immediately.

11.2 Emergency Equipment and Supplies

The SC shall verify that appropriate emergency equipment and supplies are available, as needed, and in proper working order and mark the locations of the equipment on the site map when a map is provided. The following equipment and supplies are typically required:

- Fire Extinguishers
- First aid kit
- Bloodborne pathogen kit
- Personal eye wash station
- Potable water

11.3 Incident Response

The following actions shall be taken in the event of a fire, explosion, or chemical release:

- Shut down CH2M HILL operations and evacuate the immediate area
- Notify appropriate response personnel
- Account for personnel at the designated assembly area(s)
- Assess the need for site evacuation, and evacuate the site as warranted

11.4 Evacuation Procedures

Typical evacuation procedures include the following:

- Evacuation routes and assembly areas will be designated by the SC before work begins
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation
- The SC and a "buddy" will remain on the site after the site has been evacuated (if safe) to inform local responders of the nature and location of the incident
- The SC will account for all personnel at the assembly area
- The SC will write up a report as soon as possible after the emergency the following the guidelines provided in the Incident Report Section of the HS&E Plan.

11.5 Emergency Medical Treatment

The following actions shall be taken in the event of a medical emergency:

- Get medical attention immediately.
- Notify appropriate emergency response authorities listed on the Emergency Contacts form, as necessary.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Make certain that the injured person is accompanied to the emergency room.

The SC will assume control during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room. If the injured is a CH2M HILL employee, the SC or PM must accompany the injured CH2M HILL employee to the emergency room and to any follow-up appointments until the injured is released to full duty.

If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the CH2M HILL medical consultant. When contacting the medical consultant, state that the situation is a CH2M HILL matter, and give your name and telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.

The SC shall ensure that all injuries are reported according to the guidelines in the Incident Reporting and Investigation Section of this HS&E Plan.

12.0 Recordkeeping

The following records (see Table 12-1) shall be maintained as indicated. Refer to CH2M HILL SOP HSE-15 for complete recordkeeping requirements and additional information.

TABLE 12-1
Recordkeeping Requirements

Record	Location	Duration
Medical and Exposure Records	Medical & Training Administrator	Employment + 30 years
HS&E Plans	Project File; MTA	Project duration + 5 years
HS&E Training Records	Project File; HandS Database	Employment + 30 years
Environmental Documentation (permits, approvals, manifests)	Project File; HS&E Archive	Project duration + 5 years

Attachment 1
Employee Signoff Form

CH2MHILL

EMPLOYEE SIGNOFF FORM

Health, Safety and Environment Plan

The CH2M HILL project employees and subcontractors listed below have been provided with a copy of this HS&E Plan, have read and understood it, and agree to abide by its provisions.

Project Name: Swann Park Redevelopment **Project Number:** 364267

EMPLOYEE NAME (Please print)	EMPLOYEE SIGNATURE	COMPANY	DATE

Attachment 2
Job Hazard Analysis

Activity:	**Date:**
	Project:
Description of the work:	**Site Supervisor:**
	Site Safety Officer:
	Review for latest use: **Before the job is performed.**

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)

Equipment to be used (List equipment to be used in the work activity)	Inspection Requirements (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)

	PRINT NAME	SIGNATURE	
Supervisor Name:			**Date/Time:**
Safety Officer Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

Job Hazard Analysis **Hand Augering/Soil Sampling**		**Analyzed By/Date Bill Berlett_ Reviewed By/Date: April 2007/revised 0308**
Principal Tasks	**Potential Hazards**	**Recommended Controls (Use applicable PPE in accordance with HASP)**
General Activity	Slips, trips, falls	• Use care during foot travel, and clear the area of slip and trip hazards • Use barricades as appropriate • Use guardrails as appropriate • Wear appropriate foot wear • Cover holes.
	Muscle Strain / Back Injury	• Use proper lifting technique – bend at knees, use leg muscles when lifting keep load close to the body – use buddy system/two-person lift whenever possible, . • Buddy system for heavy lifts • Perform stretching exercises prior to beginning • Use lifting/transport equipment whenever possible • Use proper hand augering techniques – do not over-force any augering – auger using a smooth and easy pace – avoid contacting subsurface materials when not wearing protective clothing – use leather work gloves when using hand auger – nitrile gloves when touching potentially contaminated materials
Digging/Extracting Materials	Struck by equipment/objects	• Wear required PPE – see HASP • Handling all sampling tools carefully – following SOPs for hand tools
	Contact with soils	• Wear required PPE – see HASP • Utilize proper hand washing and hygiene controls • Avoid vapors/dusts – follow HASP requirements for air monitoring
Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Hand Tools,	Daily inspection of equipment prior to operation	• Site specific training – Toolbox safety meetings • 40 hr Hazwoper • HazCom Training

Attachment 3
Daily Tailgate Safety Briefing Form

CH2M HILL Daily Tailgate Safety Briefing Form		
Project Name: Swann Park Redevelopment	Project Number: 364267	
Date:	Start Time:	Completed Time:
Site Location: Baltimore, MD		
Type of Work (general): Park redevelopment, soil removal, grading, sewer/utility placement, site preparation, confirmatory soil sampling, other:		

Safety Issues
Tasks (this shift):
PPE Requirements:
Chemical Hazards:
Air Monitoring Requirements:
Physical Hazards:
Control Measures:
Hazard Communication Overview (MSDSs):
Special Topics (i.e., incidents, near misses, etc.)

Daily Checklist		
HSE Plan up to date and present onsite?	Yes	No
Air monitoring equipment present, working, and calibrated?	Yes	No
Personnel training current?	Yes	No
Hospital Route Map and Emergency Phone Numbers posted onsite?	Yes	No
PPE present and worn by personnel?	Yes	No
Comments:		

Attendees	
Print Name	Sign Name
Meeting conducted by:	

Attachment 4
Pre-Task Safety Plan

CH2MHILL

Pre-Task Safety Plan (PTSP)

Project: _____ Location: _____Date:_____

Supervisor: _____ Job Activity:_____

_____

Task Personnel:

_____

_____

_____

_____

List Tasks:

_____

_____

_____

_____

Tools/Equipment Required for Tasks (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools):

_____

_____

_____

Potential H&S Hazards, including chemical, physical, safety, biological and environmental (check all that apply):

__ Chemical burns/contact	__ Trench, excavations, cave-ins	__ Ergonomics
__ Pressurized lines/equipment	__ Overexertion	__ Chemical splash
__ Thermal burns	__ Pinch points	__ Poisonous plants/insects
__ Electrical	__ Cuts/abrasions	__ Eye hazards/flying projectile
__ Weather conditions	__ Spills	__ Inhalation hazard
__ Heights/fall > 6 feet	__ Overhead Electrical hazards	__ Heat/cold stress
__ Noise	__ Elevated loads	__ Water/drowning hazard
__ Explosion/fire	__ Slips, trip and falls	__ Heavy equipment
__ Radiation	__ Manual lifting	__ Aerial lifts/platforms
__ Confined space entry	__ Welding/cutting	__ Demolition

Other Potential Hazards (Describe):

_____

_____

_____

_____

Hazard Control Measures (Check All That Apply):			
PPE __ Thermal/lined __ Eye __ Dermal/hand __ Hearing __ Respiratory __ Reflective vests __ Flotation device	Protective Systems __ Sloping __ Shoring __ Trench box __ Barricades __ Competent person __ Locate buried utilities __ Daily inspections	Fire Protection __ Fire extinguishers __ Fire watch __ Non-spark tools __ Grounding/bonding __ Intrinsically safe equipment	Electrical __ Lockout/tagout __ Grounded __ Panels covered __ GFCI/extension cords __ Power tools/cord inspected
Fall Protection __ Harness/lanyards __ Adequate anchorage __ Guardrail system __ Covered opening __ Fixed barricades __ Warning system	Air Monitoring __ PID/FID __ Detector tubes __ Radiation __ Personnel sampling __ LEL/O2 __ Other	Proper Equipment __ Aerial lift/ladders/scaffolds __ Forklift/heavy equipment __ Backup alarms __ Hand/power tools __ Crane with current inspection __ Proper rigging __ Operator qualified	Welding & Cutting __ Cylinders secured/capped __ Cylinders separated/upright __ Flash-back arrestors __ No cylinders in CSE __ Flame retardant clothing __ Appropriate goggles
Confined Space Entry __ Isolation __ Air monitoring __ Trained personnel __ Permit completed __ Rescue	Medical/ER __ First-aid kit __ Eye wash __ FA-CPR trained personnel __ Route to hospital	Heat/Cold Stress __ Work/rest regime __ Rest area __ Liquids available __ Monitoring __ Training	Vehicle/Traffic __ Traffic control __ Barricades __ Flags __ Signs
Permits __ Hot work __ Confined space __ Lockout/tagout __ Excavation __ Demolition __ Energized work	Demolition __ Pre-demolition survey __ Structure condition __ Isolate area/utilities __ Competent person __ Hazmat present	Inspections: __ Ladders/aerial lifts __ Lanyards/harness __ Scaffolds __ Heavy equipment __ Cranes and rigging	Training: __ Hazwaste __ Construction __ Competent person __ Task-specific (THA) __ Hazcom
Field Notes:_____ _____ _____ _____ _____			

Name (Print): _____

Signature:_____ Date:_____

Attachment 5
Project Activity Self-Assessment Checklists

CH2MHILL

HS&E Self-Assessment Checklist - EARTHMOVING EQUIPMENT

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI.

This checklist is to be used at locations where: 1) CH2M HILL employees are potentially exposed to the hazards of earthmoving equipment operations, 2) CH2M HILL employees are operating earthmoving equipment, and/or 3) CH2M HILL provides oversight of a subcontractor operating earthmoving equipment.

The CH2M HILL Safety Coordinator may consult with subcontractors operating earthmoving equipment when completing this checklist, but shall not direct the means and methods of equipment operations nor direct the details of corrective actions. Earthmoving equipment subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate CH2M HILL employee exposures to earthmoving equipment hazards (complete Section 1).
☐ Evaluate CH2M HILL employees operating earthmoving equipment (complete entire checklist).
☐ Evaluate CH2M HILL subcontractor's compliance with earthmoving equipment safety requirements (complete entire checklist). Subcontractors Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the earthmoving equipment subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-306.

SAFE WORK PRACTICES (3.1) **SECTION 1**	**Yes**	**No**	**N/A**	**N/O**
1. Personnel maintaining safe distance from operating equipment	☐	☐	☐	☐
2. Positioning personnel in close proximity to operating equipment is avoided	☐	☐	☐	☐
3. Personnel wearing high-visibility and/or reflective vests when close to operating equipment	☐	☐	☐	☐
4. Personnel approach operating equipment safely	☐	☐	☐	☐
5. Personnel riding only in seats of equipment cab and using seat belts	☐	☐	☐	☐
6. Personnel not positioned under elevated portions of equipment	☐	☐	☐	☐
7. Personnel not positioned under hoisted loads	☐	☐	☐	☐
8. Personnel not hoisted by equipment	☐	☐	☐	☐
9. Personnel do not to approach equipment that has become electrically energized	☐	☐	☐	☐
10. Personnel wearing appropriate PPE, per HSP/FSI	☐	☐	☐	☐

EQUIPMENT SAFETY REQUIREMENTS PRIOR TO OPERATING EQUIPMENT (3.2.1) **SECTION 2**	**Yes**	**No**	**N/A**	**N/O**
11. Only qualified and authorized personnel operating equipment	☐	☐	☐	☐
12. Daily safety briefing/meeting conducted with equipment operators	☐	☐	☐	☐
13. Daily inspection of equipment conducted and documented	☐	☐	☐	☐
14. Modifications and attachments used approved by equipment manufacturer	☐	☐	☐	☐
15. Backup alarm or spotter used when backing equipment	☐	☐	☐	☐
16. Operational horn provided on bi-directional equipment	☐	☐	☐	☐
17. Seat belts are provided and used	☐	☐	☐	☐
18. Rollover protective structures (ROPS) provided	☐	☐	☐	☐
19. Braking system capable of stopping full payload	☐	☐	☐	☐
20. Headlights and taillights operable when additional light required	☐	☐	☐	☐
21. Brake lights in operable condition	☐	☐	☐	☐
22. Cab glass provides no visible distortion to the operator	☐	☐	☐	☐
23. All machine guards are in place	☐	☐	☐	☐
24. Hauling equipment (dump trucks) provided with cab shield or canopy	☐	☐	☐	☐
25. Dump truck beds provided with positive means of support during maintenance or inspection	☐	☐	☐	☐
26. Dump truck operating levers provided with latch to prevent accidental dumping	☐	☐	☐	☐
27. Air monitoring conducted per HSP/FSI for hazardous atmospheres	☐	☐	☐	☐
EQUIPMENT PLACEMENT (3.2.2)				
28. Equipment position on firm/level surface, outriggers used	☐	☐	☐	☐
29. Location of underground utilities identified	☐	☐	☐	☐
30. Safe clearance distance maintained while working under overhead power lines	☐	☐	☐	☐
31. Safe distance is maintained while traveling under power lines	☐	☐	☐	☐
32. Warning system used to remind operator of excavation edge	☐	☐	☐	☐
33. Unattended equipment visibly marked at night	☐	☐	☐	☐
34. Tools lowered/parking brake set when not in use, wheels chocked when parked on incline	☐	☐	☐	☐
EQUIPMENT OPERATION (3.2.3)				
35. Equipment operated on safe roadways and grades	☐	☐	☐	☐
36. Equipment operated at safe speed	☐	☐	☐	☐
37. Operators maintain unobstructed view of travel path	☐	☐	☐	☐
38. Equipment not operated during inclement weather, lightning storms	☐	☐	☐	☐
39. Equipment started and moved safely	☐	☐	☐	☐
40. Operators keep body parts inside cab during operation	☐	☐	☐	☐
41. Vehicle occupants in safe position while loading/unloading	☐	☐	☐	☐
42. Signal person visible to operator when required	☐	☐	☐	☐
43. Equipment used for hoisting done according to equipment manufacturer specifications	☐	☐	☐	☐
44. Lifting and hauling capacities are not exceeded	☐	☐	☐	☐
EQUIPMENT MAINTENANCE (3.2.4)				
45. Defective components repaired immediately	☐	☐	☐	☐
46. Suspended equipment or attachments supported prior to work under or between	☐	☐	☐	☐
47. Lockout/tagout procedures used prior to maintenance	☐	☐	☐	☐
48. Tires on split rims removed using safety tire rack or cage	☐	☐	☐	☐
49. Good housekeeping maintained on and around equipment	☐	☐	☐	☐
EXCAVATING AT HAZARDOUS WASTE SITES (3.2.5)				
50. Waste disposed of according to HSP/FSI	☐	☐	☐	☐
51. Appropriate decontamination procedures being followed, per HSP/FSI	☐	☐	☐	☐

SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

Auditor: _____ Project Manager: _____

CH2MHILL

H&S Self-Assessment Checklist – CONCRETE AND MASONRY

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's written safety plan.

This checklist is to be used at locations where: 1) CH2M HILL staff are exposed to concrete and masonry hazards; 2) CH2M HILL staff are self-performing concrete and masonry activities; and/or 3) CH2M HILL oversight of a concrete and masonry subcontractor is required.

Safety Coordinators may consult with subcontractors when completing this checklist but shall not direct the means and methods of concrete and masonry operations nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies, and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate CH2M HILL staff exposure to concrete and masonry hazards (complete Section 1).
☐ Evaluate CH2M HILL staff who self-perform concrete and masonry activities (complete entire checklist).
☐ Evaluate a CH2M HILL subcontractor's compliance with concrete and masonry requirements (complete entire checklist).
Subcontractor's Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HSE-43.

SECTION 1

		Yes	No	N/A	N/O
SAFE WORK PRACTICES (4.1)					
1.	Personnel in areas where concrete is being poured wearing required protective equipment	☐	☐	☐	☐
2.	Personnel not working above unguarded protruding reinforced steel (rebar)	☐	☐	☐	☐
3.	Personnel not riding concrete buckets nor positioned under elevated buckets	☐	☐	☐	☐
4.	Personnel maintain safe distance from formwork and shoring being removed	☐	☐	☐	☐
5.	Personnel maintain safe distance from precast and lift-slab concrete being lifted into position	☐	☐	☐	☐
6.	Personnel not positioned behind jacks during post-tension operations	☐	☐	☐	☐
7.	Personnel not permitted in structures nor beneath concrete while slabs are being lifted/jacked	☐	☐	☐	☐
8.	Personnel not entering limited access zones during masonry wall construction	☐	☐	☐	☐
9.	Personnel not entering bulk cement storage facilities until shut down and locked out	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
GENERAL REQUIREMENTS (4.2.1)				
10. Daily safety briefing/meeting conducted with personnel	☐	☐	☐	☐
11. Concrete structures capable of supporting any load placed on the structure	☐	☐	☐	☐
12. All protruding rebar, onto which personnel could fall, is guarded	☐	☐	☐	☐
13. Only essential personnel permitted in post-tensioning areas	☐	☐	☐	☐
14. Signs/barriers erected to limit personnel access to post-tensioning areas	☐	☐	☐	☐
15. Elevated concrete buckets routed so fewest personnel exposed to falling debris	☐	☐	☐	☐
16. Scaffolding conforms to the requirements of SOP HSE-73 prior to CH2M HILL use	☐	☐	☐	☐
17. Excavations conform to the requirements of SOP HSE-32 prior to CH2M HILL entry	☐	☐	☐	☐
TOOLS AND EQUIPMENT (4.2.2)				
18. Concrete mixers have mechanical clearing devices and guardrails installed, as required	☐	☐	☐	☐
19. Powered/rotating concrete troweling machines equipped with appropriate shutoff devices	☐	☐	☐	☐
20. Concrete buggy handles do not extend beyond the wheels on either side of the buggy	☐	☐	☐	☐
21. Concrete pumping systems using discharge pipes are provided with pipe supports	☐	☐	☐	☐
22. Compressed air hoses equipped with positive fail-safe connectors to prevent separation	☐	☐	☐	☐
23. Concrete buckets with hydraulic/pneumatic gates have positive safety devices	☐	☐	☐	☐
24. Sections of tremies and similar concrete conveyances are secured with wire rope	☐	☐	☐	☐
25. Bull float handles used where they might contact conductors are nonconductive or insulated	☐	☐	☐	☐
26. Masonry saws are guarded with a semicircular enclosure over the blade	☐	☐	☐	☐
27. Equipment maintenance/repair only performed after equipment is shut down and locked out	☐	☐	☐	☐
FORMWORK AND SHORING FOR CAST-IN-PLACE CONCRETE (4.2.3)				
28. Formwork is capable of supporting loads that may be reasonably anticipated to be applied	☐	☐	☐	☐
29. Formwork and shoring plans available at the jobsite	☐	☐	☐	☐
30. Shoring sills are sound, rigid, and capable of carrying the maximum intended load	☐	☐	☐	☐
31. Whenever single-post shores are tiered, shoring is designed and inspected, as required	☐	☐	☐	☐
32. Shoring and reshoring equipment inspected prior to erection	☐	☐	☐	☐
33. Damaged shoring equipment is not used	☐	☐	☐	☐
34. Shoring is inspected prior to, during, and immediately after concrete placement	☐	☐	☐	☐
35. All base plates, shore heads, extension devices, and adjustment screws are installed correctly	☐	☐	☐	☐
36. No eccentric loads on shore heads unless designed for such loading	☐	☐	☐	☐
37. Tiered single-post shores are vertically aligned and adequately braced, as required	☐	☐	☐	☐
38. Adjustment of single-post shores to raise formwork is not made after placement of concrete	☐	☐	☐	☐
39. Rebar for walls, piers, columns, and other vertical structures adequately supported	☐	☐	☐	☐
40. Unrolled wire mesh secured at each end or roll turned over to prevent the roll from recoiling	☐	☐	☐	☐
41. Forms/shores only removed after concrete tested for sufficient strength	☐	☐	☐	☐
42. Reshoring installed if concrete is required to support loads in excess of its capacity	☐	☐	☐	☐
43. Reshoring not removed until concrete being supported has attained adequate strength	☐	☐	☐	☐
VERTICAL SLIP FORMS (4.2.3)				
44. Forms designed to prevent excessive distortion of structure during the jacking operation	☐	☐	☐	☐
45. Forms provided with scaffolds or work platforms where personnel are required to work or pass	☐	☐	☐	☐
46. Steel rods/pipes on which jacks climb designed for that purpose and adequately braced	☐	☐	☐	☐
47. Jacks/vertical supports positioned so that loads do not exceed the rated capacity of the jacks	☐	☐	☐	☐
48. Jacks/lifting devices provided with mechanical dogs or other automatic holding devices	☐	☐	☐	☐
49. Form structure maintained within all design tolerances specified for plumbness	☐	☐	☐	☐
50. Predetermined safe rate of lift shall not be exceeded	☐	☐	☐	☐

SECTION 2 (Continued)	Yes	No	N/A	N/O
PRECAST CONCRETE CONSTRUCTION (4.2.4)				
51. Only essential personnel permitted under precast members being lifted or tilted	☐	☐	☐	☐
52. Wall panels adequately supported until permanent connections completed	☐	☐	☐	☐
53. Lifting inserts of tilt-up members capable of supporting 2 times the maximum intended load	☐	☐	☐	☐
54. Lifting inserts of lifted members capable of supporting 4 times the maximum intended load	☐	☐	☐	☐
55. Lifting hardware capable of supporting 5 times the maximum intended load	☐	☐	☐	☐
LIFT-SLAB CONCRETE CONSTRUCTION (4.2.5)				
56. Lift-slab operations are designed and planned by a registered professional engineer	☐	☐	☐	☐
57. Jacks/lifting units are marked to indicate the manufacturer's rated capacity	☐	☐	☐	☐
58. Jacking equipment capable of supporting at least two and one-half times the load	☐	☐	☐	☐
59. Jacks/lifting units are not loaded beyond the manufacturer's rated capacity.	☐	☐	☐	☐
60. Jacks/lifting units are designed not to lift or continue to lift beyond their rated capacity	☐	☐	☐	☐
61. Jacks/lifting units have safety device that will provide load support upon malfunction	☐	☐	☐	☐
62. Equipment is designed/installed so that lifting rods cannot slip out of position	☐	☐	☐	☐
63. Jacks/lifting units are positively secured to columns so they are not dislodged or dislocated.	☐	☐	☐	☐
64. Only essential personnel permitted in structure while jacking is occurring	☐	☐	☐	☐
65. Only essential personnel are permitted beneath a slab while it is being lifted	☐	☐	☐	☐
66. Jacking operations are synchronized to maintain slab within ½ inch of level position	☐	☐	☐	☐
67. If automatic leveling used, a device is installed that will stop the operation as required	☐	☐	☐	☐
68. If manual leveling used, competent person attending centrally located controls	☐	☐	☐	☐
69. The maximum number of manually controlled jacks/lifting units on one slab is limited in number based on the ability of the operator to keep slab level	☐	☐	☐	☐
70. When making temporary connections to support slabs, wedges are secured	☐	☐	☐	☐
71. A certified welder performs all welding on temporary and permanent connections	☐	☐	☐	☐
72. Load transfers from jacks/lifting units to building columns not performed until welds on the column shear plates (weld blocks) are cooled to air temperature.	☐	☐	☐	☐
MASONRY WALL CONSTRUCTION (4.2.6)				
73. Limited-access zone is established whenever a masonry wall is being constructed	☐	☐	☐	☐
74. Limited-access zone is established prior to the start of construction of the wall	☐	☐	☐	☐
75. Limited-access zone equal to the height of the wall to be constructed plus 4 feet	☐	☐	☐	☐
76. Limited-access zone runs the entire length of the wall on the side not scaffolded	☐	☐	☐	☐
77. Limited-access zone remains in place until the wall is adequately braced	☐	☐	☐	☐
78. Limited-access zone restricts entry to personnel not engaged in constructing the wall	☐	☐	☐	☐
79. Masonry walls over 8 feet in height adequately braced to prevent collapse	☐	☐	☐	☐

SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

Auditor: _____ Project Manager: _____

CH2MHILL

H&S Self-Assessment Checklist – HAND AND POWER TOOLS

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI.

This checklist is to be used at locations where: 1) CH2M HILL employees are exposed to hand and power tool hazards and/or 2) CH2M HILL provides oversight of subcontractor personnel who are exposed to hand and power tool hazards.

SSC or DSC may consult with subcontractors when completing this checklist, but shall not direct the means and methods of hand and power tool use nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the HS&E Staff for review.

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate CH2M HILL employee exposure to hand and power tool hazards.
☐ Evaluate a CH2M HILL subcontractor's compliance with hand and power tool requirements.
Subcontractors Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-50.

SECTION 1

	Yes	No	N/A	N/O
SAFE WORK PRACTICES (3.1)				
1. All tools operated according to manufacturer's instructions and design limitations.	☐	☐	☐	☐
2. All hand and power tools maintained in a safe condition and inspected and tested before use.	☐	☐	☐	☐
3. Defective tools are tagged and removed from service until repaired.	☐	☐	☐	☐
4. PPE is selected and used according to tool-specific hazards anticipated.	☐	☐	☐	☐
5. Power tools are not carried or lowered by their cord or hose.	☐	☐	☐	☐
6. Tools are disconnected from energy sources when not in use, servicing, cleaning, etc.	☐	☐	☐	☐
7. Safety guards remain installed or are promptly replaced after repair.	☐	☐	☐	☐
8. Tools are stored properly.	☐	☐	☐	☐
9. Cordless tools and recharging units both conform to electrical standards and specifications.	☐	☐	☐	☐
10. Tools used in explosive environments are rated for such use.	☐	☐	☐	☐
11. Knife or blade hand tools are used with the proper precautions.	☐	☐	☐	☐
12. Consider controls to avoid muscular skeletal, repetitive motion, and cumulative trauma stressors.	☐	☐	☐	☐

H&S Self-Assessment Checklist – HAND AND POWER TOOLS

SECTION 2	Yes	No	N/A	N/O
GENERAL (3.2.1)				
13. PPE is selected and used according to tool-specific hazards anticipated.	☐	☐	☐	☐
14. Tools are tested daily to assure safety devices are operating properly.	☐	☐	☐	☐
15. Damaged tools are removed from service until repaired.	☐	☐	☐	☐
16. Power operated tools designed to accommodate guards have guards installed.	☐	☐	☐	☐
17. Rotating or moving parts on tools are properly guarded.	☐	☐	☐	☐
18. Machines designed for fixed locations are secured or anchored.	☐	☐	☐	☐
19. Floor and bench-mounted grinders are provided with properly positioned work rests.	☐	☐	☐	☐
20. Guards are provided at point of operation, nip points, rotating parts, etc.	☐	☐	☐	☐
21. Fluid used in hydraulic-powered tools is approved fire-resistant fluid.	☐	☐	☐	☐
ELECTRIC-POWERED TOOLS (3.2.2)				
22. Electric tools are approved double insulated or grounded and used according to SOP HS-23.	☐	☐	☐	☐
23. Electric cords are not used for hoisting or lowering tools.	☐	☐	☐	☐
24. Electric tools are used in damp/ wet locations are approved for such locations or GFCI installed.	☐	☐	☐	☐
25. Hand-held tools are equipped with appropriate on/off controls appropriate for the tool.	☐	☐	☐	☐
26. Portable, power-driven circular saws are equipped with proper guards.	☐	☐	☐	☐
ABRASIVE WHEEL TOOLS (3.2.3)				
27. All employees using abrasive wheel tools are wearing eye protection.	☐	☐	☐	☐
28. All grinding machines are supplied with sufficient power to maintain spindle speed.	☐	☐	☐	☐
29. Abrasive wheels are closely inspected and ring-tested before use.	☐	☐	☐	☐
30. Grinding wheels are properly installed.	☐	☐	☐	☐
31. Cup-type wheels for external grinding are protected by the proper guard or flanges.	☐	☐	☐	☐
32. Portable abrasive wheels used for internal grinding are protected by safety flanges.	☐	☐	☐	☐
33. Safety flanges are used only with wheels designed to fit the flanges.	☐	☐	☐	☐
34. Safety guards on abrasive wheel tools are mounted properly and of sufficient strength.	☐	☐	☐	☐
PNEUMATIC-POWERED TOOLS (3.2.4)				
35. Tools are secured to hoses or whip by positive means to prevent disconnection.	☐	☐	☐	☐
36. Safety clips or retainers are installed to prevent attachments being expelled.	☐	☐	☐	☐ 37.
Safety devices are installed on automatic fastener feed tools as required.	☐	☐	☐	☐
38. Compressed air is not used for cleaning unless reduced to < 30 psi, with PPE, and guarded.	☐	☐	☐	☐
39. Manufacturer's safe operating pressure for hoses, pipes, valves, etc. are not exceeded.	☐	☐	☐	☐
40. Hoses are not used for hoisting or lowering tools.	☐	☐	☐	☐
41. All hoses >1/2-inch diameter have safety device at source to reduce pressure upon hose failure.	☐	☐	☐	☐
42. Airless spray guns have required safety devices installed.	☐	☐	☐	☐
43. Blast cleaning nozzles are equipped with operating valves, which are held open manually.	☐	☐	☐	☐
44. Supports are provided for mounting nozzles when not in use.	☐	☐	☐	☐
45. Air receiver drains, handholes, and manholes are easily accessible.	☐	☐	☐	☐
46. Air receivers are equipped with drainpipes and valves for removal of accumulated oil and water.	☐	☐	☐	☐
47. Air receivers are completely drained at required intervals.	☐	☐	☐	☐
48. Air receivers are equipped with indicating pressure gauges.	☐	☐	☐	☐
49. Safety, indicating, and controlling devices are installed as required.	☐	☐	☐	☐
50. Safety valves are tested frequently and at regular intervals to assure good operating condition.	☐	☐	☐	☐

SECTION 2 (continued)

	Yes	No	N/A	N/O
LIQUID FUEL-POWERED TOOLS (3.2.5)				
51. Liquid fuel-powered tools are stopped when refueling, servicing, or maintaining.	☐	☐	☐	☐
52. Liquid fuels are stored, handled, and transported in accordance with SOP HS-21	☐	☐	☐	☐
53. Liquid fuel-powered tools are used in confined spaces in accordance with SOP HS-17.	☐	☐	☐	☐
54. Safe operating pressures of hoses, valves, pipes, filters, and other fittings are not exceeded.	☐	☐	☐	☐
POWDER-ACTUATED TOOLS (3.2.6)				
55. Only trained employee operates powder-actuated tools.	☐	☐	☐	☐
56. Powder-actuated tools are not loaded until just prior to intended firing time.	☐	☐	☐	☐
57. Tools are not pointed at any employee at any time.	☐	☐	☐	☐
58. Hands are kept clear of open barrel end.	☐	☐	☐	☐
59. Loaded tools are not left unattended.	☐	☐	☐	☐
60. Fasteners are not driven into very hard or brittle materials.	☐	☐	☐	☐
61. Fasteners are not driven into easily penetrated materials unless suitable backing is provided.	☐	☐	☐	☐
62. Fasteners are not driven into spalled areas.	☐	☐	☐	☐
63. Powder-actuated tools are not used in an explosive or flammable atmosphere.	☐	☐	☐	☐
64. All tools are used with correct shields, guards, or attachments recommended by manufacturer.	☐	☐	☐	☐
JACKING TOOLS (3.2.7)				
65. Rated capacities are legibly marked on jacks and not exceeded.	☐	☐	☐	☐
66. Jacks have a positive stop to prevent over-travel.	☐	☐	☐	☐
67. The base of jacks are blocked or cribbed to provide a firm foundation, when required.	☐	☐	☐	☐
68. Wood blocks are place between the cap and load to prevent slippage, when required.	☐	☐	☐	☐
69. After load is raised, it is cribbed, blocked, or otherwise secured immediately.	☐	☐	☐	☐
70. Antifreeze is used when hydraulic jacks are exposed to freezing temperatures.	☐	☐	☐	☐
71. All jacks are properly lubricated.	☐	☐	☐	☐
72. Jacks are inspected as required.	☐	☐	☐	☐
73. Repair or replacement parts are examined for possible defects.	☐	☐	☐	☐
74. Jacks not working properly are removed from service and repaired or replaced.	☐	☐	☐	☐
HAND TOOLS (3.2.8)				
75. Wrenches are not used when jaws are sprung to the point of slippage.	☐	☐	☐	☐
76. Impact tools are kept free of mushroomed heads.	☐	☐	☐	☐
77. Wooden handles of tools are kept free of splinters or cracks and are tightly fitted in tool.	☐	☐	☐	☐

SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

Auditor: _____ Project Manager: _____

CH2MHILL

HS&E Self-Assessment Checklist - HAZARDOUS WASTE MANAGEMENT

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI.

This checklist is to be used at locations where: 1) CH2M HILL employees are potentially exposed to hazards associated with waste management operations (complete Sections 1 and 3), and/or 2) CH2M HILL oversight of a hazardous waste management subcontractor is required (complete entire checklist).

SSEC/DSEC may consult with hazardous waste management subcontractors when completing this checklist, but shall not direct the means and methods of hazardous waste management operations nor direct the details of corrective actions. Waste management subcontractors shall determine how to correct deficiencies and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the Health and Safety Manager for review.

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate CH2M HILL employee exposure to hazardous waste.
☐ Evaluate a CH2M HILL subcontractor's compliance with the hazardous waste management requirements.
Subcontractors Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-80.

SECTION 1

	Yes	No	N/A	N/O
PERMITS AND NOTIFICATIONS (7.0)				
1. Client site has an EPA ID Number or RCRA permit.	☐	☐	☐	☐
2. CH2M activities comply with client's RCRA permit.	☐	☐	☐	☐
ACCUMULATION (8.0)				
3. LQG — accumulates hazardous waste for up to 90 days.	☐	☐	☐	☐
4. SQG — accumulates hazardous waste for up to 180 days.	☐	☐	☐	☐
5. CESQGs — no limit on accumulation unless it exceeds 1,000kg.	☐	☐	☐	☐
CONTAINERS (8.1)				
6. Hazardous wastes are packaged according to DOT requirements.	☐	☐	☐	☐
7. Container inspections are documented in writing using the Container Inspection Checklist.	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
MARKING AND LABELING (8.2)				
Uncharacterized Waste (8.2.1)				
8. Containers of unknown wastes are marked with a description of the contents.	☐	☐	☐	☐
9. The accumulation start date is marked on the container.	☐	☐	☐	☐
10. Containers are marked with a unique identifier.	☐	☐	☐	☐
11. Non-classified label used for unclassified waste.	☐	☐	☐	☐
Non-Hazardous Waste (8.2.2)				
12. All containers must be marked an labeled, including non-regulated waste.	☐	☐	☐	☐
13. Non-Hazardous Waste label includes generator name, address, and description of waste.	☐	☐	☐	☐
Hazardous Waste (8.2.3)				
14. Hazardous waste identified with yellow Hazardous Waste label.	☐	☐	☐	☐
15. The accumulation start date marked and visible on the container.	☐	☐	☐	☐
16. Containers labeled according to DOT requirements.	☐	☐	☐	☐
Building/Storage Area Marking (8.2.4)				
17. Hazardous waste storage areas labeled.	☐	☐	☐	☐
ACCUMULATION AREAS (8.3)				
Satellite Accumulation Area (8.3.1)				
18. Up to 55 gal. of hazardous waste or 1 qt. of acutely haz. waste accumulated for unlimited time.	☐	☐	☐	☐
19. Accumulation area at or near the point of generation.	☐	☐	☐	☐
20. Area under control of waste generator.	☐	☐	☐	☐
90-Day Accumulation Area (8.3.2)				
21. Hazardous waste >55 gal. stored for 90 days in managed accumulation area.	☐	☐	☐	☐
22. Accumulation area is used only for storage of waste.	☐	☐	☐	☐
23. Container requirements have been followed.	☐	☐	☐	☐
24. Emergency spill response procedures posted and spill kit available.	☐	☐	☐	☐
25. Fire extinguisher, water supply, telephone, and alarm are located in accumulation area.	☐	☐	☐	☐
26. Emergency shower/eyewash station available, tested and functioning.	☐	☐	☐	☐
27. Accumulation area is locked when authorized personnel are not available.	☐	☐	☐	☐
28. Appropriate signs posted at the entrance.	☐	☐	☐	☐
29. Secondary containment provided for liquid hazardous waste.	☐	☐	☐	☐
30. Weekly inspections logged into book using Accumulation Area Inspection Log Sheet.	☐	☐	☐	☐
31. "NO SMOKING OR OPEN FLAME" signs posted.	☐	☐	☐	☐
32. Prior to closure all containers, liners, or containment devices removed or decontaminated.	☐	☐	☐	☐
CONTINGENCY PLAN AND EMERGENCY PROCEDURES (9.0)				
33. Contingency plans and emergency procedures have been incorporated in work plans.	☐	☐	☐	☐
TRAINING (10.0)				
34. Personnel handling hazardous waste have appropriate training.	☐	☐	☐	☐

SECTION 3	Yes	No	N/A	N/O
OFFSITE DISPOSAL (11.0)				
35. Disposal facilities identified using the procedures in HSE-79.	☐	☐	☐	☐
36. Disposal facilities evaluated under Waste Subcontractor Qualification Procedure in HSE-84.	☐	☐	☐	☐
37. Waste characterization, sampling, and analysis procedures in HSE-79 followed.	☐	☐	☐	☐
Evaluate Land Disposal Restrictions (11.3)				
Identification of Treatment Standards (11.3.1)				
38. Waste characterized and waste codes determined.	☐	☐	☐	☐
39. LDR exemptions identified.	☐	☐	☐	☐
40. Alternate treatment standards evaluated.	☐	☐	☐	☐
41. Waste determined to be wastewater or non-wastewater.	☐	☐	☐	☐
42. Treatment standards identified.	☐	☐	☐	☐
43. Universal Treatment Standards (UTS) identified.	☐	☐	☐	☐
Confirm Final Disposal Options (11.4)				
44. Disposal facilities waste profile forms have been completed.	☐	☐	☐	☐
45. Client signatures have been obtained on waste profile forms.	☐	☐	☐	☐
46. Signed waste profile forms and enclosures have been submitted to the disposal facility.	☐	☐	☐	☐
OFFSITE TRANSPORT (12.0)				
47. Transporter has documented H&S and monitoring program and written spill response plan.	☐	☐	☐	☐
48. Transporter is permitted in the state and has disposal facilities listed on their permit.	☐	☐	☐	☐
49. Transporter can service origin and destination state and disposal facility.	☐	☐	☐	☐
50. Transporter can meet proposed shipment schedule.	☐	☐	☐	☐
51. Disposal facility accepted waste and issued approval letter.	☐	☐	☐	☐
Manifesting (12.1)				
52. Manifest and LDR notification/certification form completed.	☐	☐	☐	☐
53. Manifest includes reference no., shipping name, hazard class, ID no., and packaging group.	☐	☐	☐	☐
54. DOT trained staff completed manifest.	☐	☐	☐	☐
55. Manifest is for the state where the waste will be disposed.	☐	☐	☐	☐
56. Pre-shipment manifest review completed.	☐	☐	☐	☐
57. Original signed manifest returned to client within 35 days of ship date.	☐	☐	☐	☐
58. Waste shipments tracked using Waste Tracking Form.	☐	☐	☐	☐
Waste Pickup (12.2)				
59. Signed shipping papers have been delivered to project site.	☐	☐	☐	☐
60. Individual assigned to supervise pickup and ensure transporter signs manifest.	☐	☐	☐	☐
61. Onsite representative must not sign any shipping documents unless authorized under contract.	☐	☐	☐	☐
RECORDKEEPING AND REPORTING (13.0)				
Copies of Waste Profiles (13.1)				
62. Two copies of completed, signed profile forms(s) and documentation for CH and client files.	☐	☐	☐	☐
Copies of Shipping Documents (13.2)				
63. Keep copy of all manifests in project file.	☐	☐	☐	☐
64. Manifest copies distributed to agencies, client and project file.	☐	☐	☐	☐
Recordkeeping (13.2.1)				
Copies of the following documents should be maintained by the client and CH2M HILL for at least 3 years from the date the hazardous waste was accepted by the initial transporter.				
65. Manifests signed by the disposal facility.	☐	☐	☐	☐
66. LDR notification and certification forms (must be retained for 5 years)	☐	☐	☐	☐
67. Biennial reports	☐	☐	☐	☐
68. Exception reports	☐	☐	☐	☐
69. Hazardous waste characterization information.	☐	☐	☐	☐

SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

CH2MHILL

H&S Self-Assessment Checklist – TRAFFIC CONTROL

This checklist shall be used by CH2M HILL personnel **only** and shall be completed at the frequency specified in the project's HSP/FSI.

This checklist is to be used at locations where: 1) CH2M HILL employees are exposed to traffic hazards and/or 2) CH2M HILL provides oversight of subcontractor personnel who are exposed to traffic hazards.

SSC or DSC may consult with subcontractors when completing this checklist, but shall not direct the means and methods of traffic control operations nor direct the details of corrective actions. Subcontractors shall determine how to correct deficiencies, and we must carefully rely on their expertise. Items considered to be imminently dangerous (possibility of serious injury or death) shall be corrected immediately or all exposed personnel shall be removed from the hazard until corrected.

Completed checklists shall be sent to the HS&E Staff for review.

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Auditor: _____ Title: _____ Date: _____

This specific checklist has been completed to:

☐ Evaluate CH2M HILL employee exposure to traffic hazards.
☐ Evaluate a CH2M HILL subcontractor's compliance with traffic control requirements.
Subcontractors Name: _____

- Check "Yes" if an assessment item is complete/correct.
- Check "No" if an item is incomplete/deficient. Deficiencies shall be brought to the immediate attention of the subcontractor. Section 3 must be completed for all items checked "No."
- Check "N/A" if an item is not applicable.
- Check "N/O" if an item is applicable but was not observed during the assessment.

Numbers in parentheses indicate where a description of this assessment item can be found in Standard of Practice HS-24.

SECTION 1

	Yes	No	N/A	N/O
SAFE WORK PRACTICES (3.1)				
1. Personnel working on/adjacent to active roadways or in control zones are wearing safety vests.	☐	☐	☐	☐
2. Traffic control plan (TCP) is consistent with roadway, traffic, and working conditions.	☐	☐	☐	☐
3. TCP has been approved by regulatory or contractual authority prior to work.	☐	☐	☐	☐
4. TCP considers all factors that may influence traffic related hazards and controls.	☐	☐	☐	☐
5. Work areas are protected by rigid barriers.	☐	☐	☐	☐
6. Lookouts are used when applicable.	☐	☐	☐	☐
7. Vehicles are parked 40 feet away from work zone or are equipped with hazard beacon/strobe.	☐	☐	☐	☐
8. TMCC or TMA vehicle is used where appropriate.	☐	☐	☐	☐
9. All CH2M HILL traffic control devices conform to MUTCD standards.	☐	☐	☐	☐
10. Traffic control devices are inspected continuously.	☐	☐	☐	☐
11. Flagging is only used when other means of traffic control are inadequate.	☐	☐	☐	☐
12. Additional traffic control zone controls have been implemented.	☐	☐	☐	☐
13. Cranes do not swing loads/booms over nor do workers enter/cross live roadways (as defined).	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
GENERAL (3.2.1)				
14. Lane closings are performed when required by this SOP.	☐	☐	☐	☐
15. Traffic control configurations are based on an engineering study of the location.	☐	☐	☐	☐
16. If no study, traffic control is performed with approval of the authority having jurisdiction.	☐	☐	☐	☐
17. TCP has been prepared and understood by all responsible parties prior to work.	☐	☐	☐	☐
18. Special preparation/coordination with external parties has been conducted where applicable.	☐	☐	☐	☐
19. All contractor traffic control devices conform to MUTCD standards.	☐	☐	☐	☐
20. Traffic movement and flow are inhibited or disrupted as little as possible.	☐	☐	☐	☐
21. Supplemental equipment and activities do not interfere with traffic.	☐	☐	☐	☐
22. Drivers and pedestrians are considered when entering and traversing traffic control zone.	☐	☐	☐	☐
TRAFFIC CONTROL ZONES (3.2.2)				
23. Traffic control zones are divided into the necessary five areas.	☐	☐	☐	☐
24. Advances warning area is designed based on conditions of speed, roadways, and driver needs.	☐	☐	☐	☐
25. Advanced warning signage is spaced according to roadway type and conditions.	☐	☐	☐	☐
26. Transition areas are used to channelize traffic around the work area.	☐	☐	☐	☐
27. Buffer areas are used to provide a margin of safety for traffic and workers.	☐	☐	☐	☐
28. The buffer area is free of equipment, workers, materials, and worker vehicles.	☐	☐	☐	☐
29. The length of the buffer area is two times the posted speed limit in feet.	☐	☐	☐	☐
30. All work is contained in the work area and is closed to all traffic.	☐	☐	☐	☐
31. A termination area is used to provide traffic to return to normal lanes.	☐	☐	☐	☐
32. A downstream taper is installed in the termination area.	☐	☐	☐	☐
DEVICE INSTALLATION AND REMOVAL (3.2.3)				
33. All vehicles involved with device installation/removal have hazard beacons/strobes.	☐	☐	☐	☐
34. Devices are installed according to the order established by this SOP.	☐	☐	☐	☐
35. Devices are removed in the opposite order of installation.	☐	☐	☐	☐
36. Tapers are used to move traffic out of its normal path.	☐	☐	☐	☐
37. Tapers are created using channelizing devices.	☐	☐	☐	☐
38. The length of taper is determined by posted speed and width of lane to be closed (see formula).	☐	☐	☐	☐
39. Local police or highway patrol assist during taper installation and removal.	☐	☐	☐	☐
40. TMCC/ TMA vehicles are used to protect personnel during installation and removal of devices.	☐	☐	☐	☐
41. Cone trucks are equipped with platforms and railings.	☐	☐	☐	☐
42. Cones are the appropriate height for the specific roadway and are reflectorized.	☐	☐	☐	☐
43. Temporary sign supports are secured using sandbags to prevent movement.	☐	☐	☐	☐
44. Arrow panels are used on lane closures where required.	☐	☐	☐	☐
45. Concrete barriers are used where required.	☐	☐	☐	☐
46. Barrels, crash cushions, or energy absorbing terminals are used to protect traffic as required.	☐	☐	☐	☐
47. Changeable message signs (CMS) are used as required.	☐	☐	☐	☐
48. CMS are not used to replace required signage.	☐	☐	☐	☐
49. No more than two message panels are used in any message cycle on CMS.	☐	☐	☐	☐
FLAGGING (3.2.4)				
50. Flagging is used only when other traffic control methods are inadequate.	☐	☐	☐	☐
51. Only approved personnel with current certification are allowed to be used as flaggers.	☐	☐	☐	☐
52. Flaggers are located off the traveled portion of the roadway.	☐	☐	☐	☐
53. A communication system is established when more than one flagger is used.	☐	☐	☐	☐
54. Hand signaling by flaggers is by means of red flags, sign paddles, or red lights.	☐	☐	☐	☐
55. Flaggers are alert, positioned close enough to warn work crews, and easily identified from crew.	☐	☐	☐	☐
56. An escape plan is established by crew and flaggers prior to traffic control set up.	☐	☐	☐	☐
57. Signs indicating a flagger is present are used and removed as required.	☐	☐	☐	☐

SECTION 2	Yes	No	N/A	N/O
INSPECTION AND MAINTENANCE (3.2.5)				
58. Traffic control zones are monitored to determine their effectiveness under varying conditions.	☐	☐	☐	☐
59. Traffic control devices are inspected at the beginning and continuously during work shift.	☐	☐	☐	☐
60. Traffic control devices are restored to their proper position immediately and continuously.	☐	☐	☐	☐
61. Damaged, old, or ineffective devices are removed and replace immediately and continuously.	☐	☐	☐	☐
62. Devices using reflected light for illumination are cleaned and monitored continuously.	☐	☐	☐	☐

SECTION 3

Complete this section for all items checked "No" in Sections 1 or 2. Deficient items must be corrected in a timely manner.

Item #	Corrective Action Planned/Taken	Date Corrected

Auditor: _____ Project Manager: _____

Arsenic Fact Sheet

Uses and Occurrences

The manufacture and transportation of arsenic compounds; used in the manufacture of herbicide, pesticide, fungicides, and defoliants; used in the manufacture and handling of calcium arsenate; used in the manufacture of electrical semiconductors, diodes, and solar batteries; used as an additive for food and drinking water for animals; used as a preharvest desiccant, sugarcane ripener, soil sterilant, or for timber thinning; used as a bronzing or decolorizing addition in glass manufacturing; used in the production of opal glass and enamels; used as an addition to alloys to increase hardening and heat resistance; used during smelting of ores; used during the cleanup of soil contaminated with arsenic; used military applications; and used in the general handling, storage, and use of arsenic.

Physical Characteristics

Appearance:	Gray metal or white powder
Odor:	Odorless solid, garlic-like when heated
Flammable:	None
Flash Point:	None
Flammable Range:	None
Specific Gravity:	5.73 for arsenic metal, 3.74 for arsenic trioxide
Stability:	Stable
Incompatibilities:	Heat, hydrogen gas, and oxidizing agents
Melting Point:	Sublimes at 613°C (1135°F); 315°C (599 °F) for arsenic trioxide
Boiling Point:	Sublimes at 613°C (1135°F); 465°C (869 °F) for arsenic trioxide

Signs and Symptoms of Exposure

Short-term (Acute):	Nausea, vomiting, diarrhea, weakness, loss of appetite, cough, chest pain, giddiness, headache, and breathing difficulty.
Long-term (Chronic):	Numbness and weakness in the legs and feet, skin and eye irritation, hyperpigmentation, thickening of palms and soles (hyperkeratosis), contact dermatitis, skin sensitization, warts, ulceration, perforation of the nasal septum, and lung and lymphatic cancer.

Modes of Exposure

Inhalation:	Dusts and Vapors
Absorption:	Liquid
Ingestion:	Dusts and Liquid

Exposure Limits

Action level (AL)	5 μg/m^3
PEL	10 μg/m^3
STEL	None
TLV	10 μg/m^3

Exposure Level vs. Regulatory Requirements

EXPOSURE LEVEL (EL)	REGULATORY REQUIREMENTS
EL < AL	Maintain exposure as low as reasonably achievable.
AL > EL, EL < PEL	Implement portions of the OSHA Arsenic Standard and training.
EL > PEL	Implement all portions of the OSHA Arsenic Standard, including training, medical surveillance, engineering controls, establishment of work areas, etc.

PPE

Eye:	Safety glasses; contact lenses should **not** be worn.
Skin:	Chemical protective gloves and body protection.
Respiratory:	Air purifying respirators and supplied air respirators, depending on the exposure.

First Aid

Inhalation:	Move to fresh air; seek medical attention promptly.
Skin:	Quick drenching with water; wash skin with soap and water; seek medical attention promptly.
Eyes:	Flush with water for 15 minutes, lifting the lower and upper lids occasionally; seek medical attention promptly.
Ingestion:	Seek medical attention promptly.

Attachment 6
Safe Work Observation Form

Safe Work Observation Form		
Project: Race Street – Middle Branch Patapsco River Assessment-Sampling	Observer:	Date:
Position/Title of worker observed:	Background Information/ comments:	
Task/Observation Observed:		

- ❖ Identify and reinforce safe work practices/behaviors
- ❖ Identify and improve on at-risk practices/acts
- ❖ Identify and improve on practices, conditions, controls, and compliance that eliminate or reduce hazards
- ❖ Proactive PM support facilitates eliminating/reducing hazards (do you have what you need?)
- ❖ Positive, corrective, cooperative, collaborative feedback/recommendations

Actions & Behaviors	Safe	At-Risk	Observations/Comments
Current & accurate Pre-Task Planning/Briefing (Project safety plan, STAC, AHA, PTSP, tailgate briefing, etc., as needed)			**Positive Observations/Safe Work Practices:**
Properly trained/qualified/experienced			
Tools/equipment available and adequate			
Proper use of tools			**Questionable Activity/Unsafe Condition Observed:**
Barricades/work zone control			
Housekeeping			
Communication			
Work Approach/Habits			
Attitude			
Focus/attentiveness			**Observer's Corrective Actions/Comments:**
Pace			
Uncomfortable/unsafe position			
Inconvenient/unsafe location			
Position/Line of fire			
Apparel (hair, loose clothing, jewelry)			
Repetitive motion			**Observed Worker's Corrective Actions/Comments:**
Other…			

Attachment 7
Project-Specific Chemical Product Hazard Communication Form

CH2MHILL

Project-Specific Chemical Product Hazard Communication Form

This form must be completed prior to performing activities that expose personnel to hazardous chemicals products. Upon completion of this form, the SSC shall verify that training is provided on the hazards associated with these chemicals and the control measures to be used to prevent exposure to CH2M HILL and subcontractor personnel. Labeling and MSDS systems will also be explained. **SC shall modify table to meet actual site conditions**.

Project Name: Swann Park – Baltimore, Md **Project Number:** 364267

MSDSs will be maintained at the following location(s):

Hazardous Chemical Products Inventory

Chemical	Quantity	Location	MSDS Available	Container labels	
				Identity	Hazard
Methane	1 liter, compressed	Support Zone			
Isobutylene	1 liter, compressed	Support Zone			
Pentane	1 liter, compressed	Support Zone			
Hydrochloric acid	< 500 ml	Support Zone / sample bottles			
Nitric acid	< 500 ml	Support Zone / sample bottles			
Sulfuric Acid	< 500 ml	Support Zone / sample bottles			
Sodium hydroxide	< 500 ml	Support Zone / sample bottles			
Methanol	< 1 Gallon	Support/Decon Zones			
Hexane	< 1 Gallon	Support/Decon Zones			
pH buffers	< 500 ml	Support Zone			
MSA Sanitizer	< 1 liter	Support/Decon Zones			
Alconox/Liquinox	< 1liter	Support/Decon Zones			

Refer to SOP HS-05 *Hazard Communication* for more detailed information.

Attachment 8
Applicable Material Safety Data Sheets

Attachment 9
Chemical-Specific Training Form

CH2MHILL

CHEMICAL-SPECIFIC TRAINING FORM

Location: Swann Park, Baltimore, Md.	Project # : 364267
HCC: Arsenic Awareness Training	Trainer:

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

Arsenic general awareness training – review arsenic fact sheet and controls	

The HCC shall use the product MSDS to provide the following information concerning each of the products listed above.

☐ Physical and health hazards

☐ Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)

☐ Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants shall have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and CH2M HILL's written hazard communication program shall be made available for employee review in the facility/project hazard communication file.

Attachment 10
Biological Hazard Information

Tick-Borne Pathogens

There are six tick-borne pathogens that present a significant field hazard, and in some areas account for more than half of our serious field incidents. These procedures should be applied during any field activity where vegetation is present.

Hazard Control

The methods for controlling exposure to ticks include, in order of most-preferred to least:

- Avoiding tick habitats and ceasing operations in heavily infested areas
- Reducing tick abundance through habitat disruption or application of acracide
- Personal protection through use of repellants and protective clothing
- Frequent tick inspections and proper hygiene

Vaccinations are not available and preventative antibiotic treatment after a bite is generally not recommended.

Avoidance and Reduction of Ticks

To the extent practical, tick habitats should be avoided. In areas with significant tick infestation, consider stopping work and withdrawing from area until adequate tick population control can be achieved. Stopping and withdrawing should be considered as seriously as entering an area without proper energy control or with elevated airborne contaminants – tickborne pathogens present risk of serious illness!

In areas where significant population density or infestation exists, tick reduction should be considered. Tick reduction can be achieved by disrupting tick habitats and/or direct population reduction through the use of tick-toxic pesticides (Damminix, Dursban, Sevin, etc.).

Habitat disruption may include only simple vegetative maintenance such as removing leaf litter and trimming grass and brush. Tick populations can be reduced between 72 and 100% when leaf litter alone is removed. In more heavily infested areas, habitat disruption may include grubbing, tree trimming or removal, and pesticide application (Damminix, Dursban, Sevin, etc.). This approach is practical in smaller, localized areas or perimeter areas that require occasional access. Habitat controls are to be implemented with appropriate health and safety controls, in compliance with applicable environmental requirements, and may be best left to the property owner or tenant, or licensed pesticide vendor. Caution should be exercised when using chemical repellents or pesticides in or around areas where environmental or industrial media samples will be collected for analysis.

Personal Protection

After other prevention and controls are implemented, personal protection is still necessary in controlling exposure to ticks. Personal protection must include all of the following steps:

- So that ticks may be seen on your clothing wear light-colored clothing. Full-body New Tyvek (paper-like disposable coveralls) may also be used.
- To prevent ticks from getting underneath clothing tuck pant legs into socks or tape to boots.
- Wear long-sleeved shirts, a hat, and high boots.
- Apply DEET repellent to exposed skin or clothing per product label.

- Apply permethrin repellent to the outside of boots and clothing before wearing, per product label.
- Frequently check for ticks and remove from clothing.
- At the end of the day search your entire body for ticks (particularly groin, armpits, neck and head) and shower.
- To prevent pathogen transmission through mucous membranes or broken/cut skin, wash or disinfect hands and/or wear surgical-style nitrile gloves anytime ticks are handled.

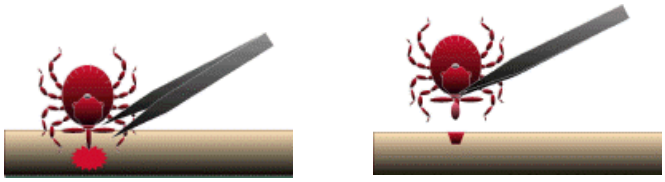
Pregnant individuals and individuals using prescription medications should consult with their physician and/or pharmacists before using chemical repellents. Because human health effects may not be fully known, use of chemical repellents should be kept to a minimum frequency and quantity. Always follow manufacturers' use instructions and precautions. Wash hands after handling, applying, or removing protective gear and clothing. Avoid hand-to-face contact, eating, drinking, smoking, etc. when applying or using repellents. Remove and wash clothes per repellent product label. Chemical repellents should not be used on infants and children.

Vaccinations are generally not available for tick-borne pathogens. Although production of the LYMErix™ lyme disease vaccination has been ceased, vaccination may still be considered under specific circumstances and with concurrence from the consulting physician. Preventative antibiotic treatment in non-ill individuals who have had a recent tick bite is recommended in specific cases only.

Tick Removal

1. Use fine-tipped tweezers or shield your fingers with a tissue, paper towel, or nitrile gloves.

2. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. (If this happens, remove mouthparts with tweezers. Consult your healthcare provider if infection occurs.)



3. Do not squeeze, crush, or puncture the body of the tick because its fluids (saliva, hemolymph, gut contents) may contain infectious organisms. Releasing these organisms to the outside of the tick's body or into the bite area may increase the chance of infectious organism transmission.

4. Do not handle the tick with bare hands because infectious agents may enter through mucous membranes or breaks in the skin. This precaution is particularly directed to individuals who remove ticks from domestic animals with unprotected fingers. Children, elderly persons, and immunocompromised persons may be at greater risk of infection and should avoid this procedure.

5. After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.

6. You may wish to save the tick for identification in case you become ill. Your doctor can use the information to assist in making an accurate diagnosis. Place the tick in a plastic bag and put it in your freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag.

Note: Folklore remedies such as petroleum jelly or hot matches do little to encourage a tick to detach from skin. In fact, they may make matters worse by irritating the tick and stimulating it to release additional saliva, increasing the chances of transmitting the pathogen. These methods of tick removal should be avoided. In addition, a number of tick removal devices have been marketed, but none are better than a plain set of fine tipped tweezers.

First-Aid and Medical Treatment

Tick bites should always be treated with first-aid. Clean and wash hands and disinfect the bite site after removing embedded tick. Consult a healthcare professional if infection or symptoms and effects of tick-borne illnesses are develop.

Medical treatment for tick-borne infections include antibiotics and other medical interventions. Diagnosis of specific illness involves both clinical and laboratory confirmations. Preventative antibiotic treatment in non-ill individuals who have had a recent tick bite is recommended in specific cases only.

Previously infected individuals are not conferred immunity – re-infection from future tick bites can occur even after a person has contracted a tick-borne disease.

Hazard Recognition

An important step in controlling tick related hazards is understanding how to identify ticks, their habitats, their geographical locations, and signs & symptoms of tick-borne illnesses.

Tick Identification

There are five varieties of hard-bodied ticks that have been associated with tick-borne pathogens. These tick varieties include:

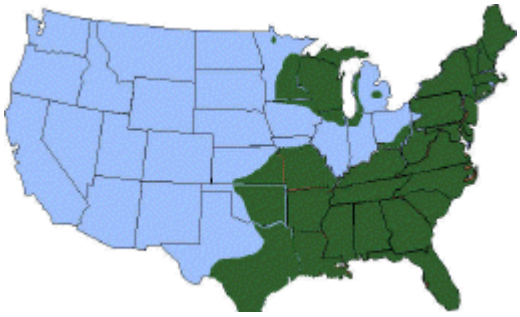
- Deer (Black Legged) Tick (eastern and pacific varieties)
- Lone Star Tick
- Dog Tick
- Rocky Mountain Wood Tick

These varieties and their geographical locations are illustrated on the following page.

Tick Habitat

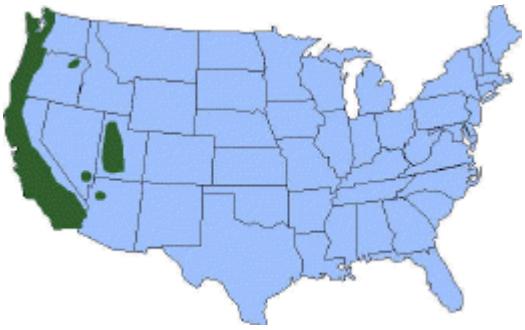
In eastern states, ticks are associated with deciduous forest and habitat containing leaf litter. Leaf litter provides a moist cover from wind, snow, and other elements. In the north-central states, is generally found in heavily wooded areas often surrounded by broad tracts of land cleared for agriculture. On the Pacific Coast, the bacteria are transmitted to humans by the western black-legged (deer) tick and habitats are more diverse. Here, ticks have been found in habitats with forest, north coastal scrub, high brush, and open grasslands. Coastal tick populations thrive in areas of high rainfall, but ticks are also found at inland locations.

Deer Tick



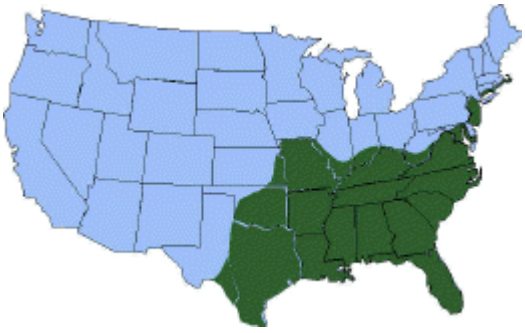
Distribution of Deer Tick (dark green)

From Left: adult female, adult male, nymph, and larvae Deer Tick (cm scale)



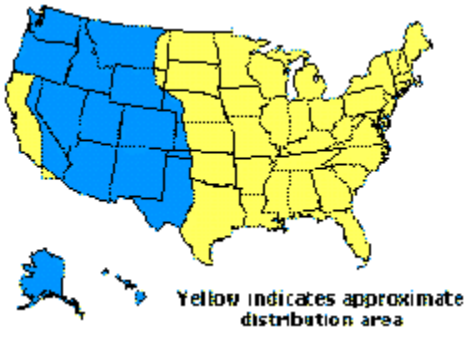
Distribution of Pacific Deer Tick (dark green)

Lone Star Tick

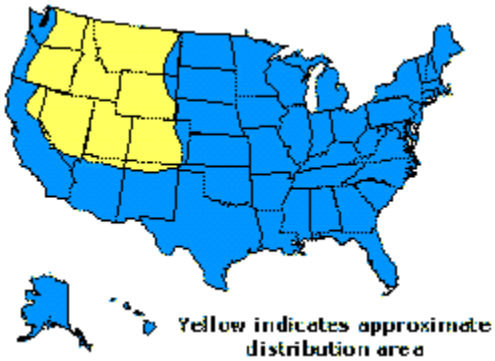


Distribution of Lone Star Tick (Green)

Dog Tick



Rocky Mountain Wood Tick



Illnesses and Signs & Symptoms

There are six notifiable tick-borne pathogens that cause human illness in the United States. These pathogens may be transmitted during a tick bite – normally hours after attachment. The illnesses, presented in approximate order of most common to least, include:

- Lyme (bacteria)
- RMSF (bacteria)
- Ehrlichiosis (bacteria)
- STARI (Southern Tick-Associated Rash Illness) (bacteria)
- Tularemia (Rabbit Fever) (bacteria)
- Babesia (protozoan parasite)

Symptoms will vary based on the illness, and may develop in infected individuals typically between 3 and 30 days after transmission. Some infected individuals will not become ill or may develop only mild symptoms. These illnesses present with some or all of the following signs & symptoms: fever, headache, muscle aches, stiff neck, joint aches, nausea, vomiting, abdominal pain, diarrhea, malaise, weakness, small solid, ring-like, or spotted rashes. The bite site may be red, swollen, or develop ulceration or lesions. A variety of long-term symptoms may result when untreated, including debilitating effects and death.

Poison Oak, Ivy and Sumac

Poison oak, ivy and sumac plants are the single most common cause of allergic skin reactions in the United States. They are caused by contact with urushiol (you-ROO-shee-ol), which is found in the sap of the plants. It is colorless or pale yellow oil that oozes from any cut or crushed part of the plant, including the roots, stems and leaves. The oil is active year round. Reaction to Poison Oak, Ivy, and Sumac ranges from no reaction to a severe "rhus" dermatitis. Rhus is the class of poisonous plants which includes poison oak, poison ivy, poison sumac, mango, and other urushiol containing plants. 3 of 4 people will develop dermatitis on contact with urushiol.

Contact with urushiol can occur in three ways: direct, indirect and airborne particles. Direct contact is touching the sap of the toxic plant, while indirect contact involves touching something which has urushiol on it, such as personal protective equipment (PPE), clothes, boots, field equipment, or any items that have come in contact with the plant (including your hands). Airborne urushiol particles, such as burning plants or spray from a weed whacker, may also contact the skin or be inhaled, causing internal inflammation.

The rash caused by urushiol can affect almost any part of the body, especially where the skin is thin, such as the face. The rash does not spread, although it may seem to when it breaks out in new areas. Actually, what happens is the urushiol absorbs more slowly into thicker skin, such as found on the forearms, legs and trunk.

Identification

Poison Oak

Poison oak shrubs are usually 12" to 30" high, or a tree-climbing vine, with triple leaflets and short, smooth hair underneath. A project site in Portland had 8' tall poison oak bushes. Early berries are fuzzy and white; later, dun-colored. Plants are red and dark green in Spring and Summer, with yellowing leaves anytime especially in dry areas. Leaves may achieve bright reds

in Fall, but the plant loses its (yellowed, then brown) leaves in Winter, leaving toxic stems. All parts of the plant remain toxic throughout the seasons.

Poison Ivy

Poison ivy plants are frequently found around lakes and streams in the Midwestern and the Eastern parts of the United States and are commonly found growing along trails and roadsides. Poison ivy grows as a woody, ropelike vine that can grow along fences or up trees, a trailing shrub on the ground, or a free-standing shrub. It normally has three leaflets (groups of leaves all on the same small stem coming off the larger main stem), but may vary from groups of three to nine. Poison ivy leaves are green in the summer and red in the fall with yellow or green flowers and white berries.

Poison Sumac

Poison sumac plants grow in boggy areas, especially in the Southeastern United States. Typically, poison sumac grows as a rangy shrub up to 15 feet tall. The plants are found to have seven to 13 smooth-edged leaflets and can have glossy pale yellow or cream-colored berries.

Primary contamination from poison oak, ivy or sumac, results from contact with bruised or broken plant parts that release "toxicodendrol", an oily resin containing the toxic chemical "urushiol".

Poison Ivy

Poison Sumac

Poison Oak

Exposure

Contamination with poison oak, ivy or sumac can happen through several pathways. These include

- Direct skin contact with any part of the plant.
- Contact with clothing that has been contaminated
- Contact from removing shoes that have been contaminated. (your shoes are coated with oil)
- Sitting in a vehicle that has become contaminated
- Contact with any objects or tools that have become contaminated.

Exposure to poison oak, ivy or sumac often becomes an OSHA recordable illness. The dermatitis is so severe that many people seek medical care and get prescription cortisone creams or steroid shots to reduce the suffering caused by the itch. If exposed, refer to the CH2M HILL HSE&Q Injury and Illness Reporting brochure for proper action to take if contaminated.

Best Work Practices

If you must work on a site that has been identified to potentially contain poison oak, ivy or sumac, the following precautions are necessary:

Identify plants containing urushiol – The best way to prevent exposure is to recognize the plant and avoid working in areas where poison oak, ivy or sumac is present.

If you must work in areas with urushiol containing plants, contact you project manager and health and safety manager to determine the best procedures to prevent contamination.

Do not drive vehicles onto the site where it will come into contact with poison oak, ivy or sumac. Vehicles which need to work in the area, such as drill rigs or heavy equipment must be washed and decontaminated as soon as possible after leaving the site.

All tools used in the area, including those used to cut back the plants, surveying instruments used in the area, air monitoring equipment or other test apparatus must be decontaminated before they are placed back into the site vehicle. If on-site decontamination is not possible, use plastic to wrap any tools or equipment until they can be decontaminated. If working on or near the ground surface, place plastic on the ground to cover the grass and foliage.

Personal protective equipment (PPE), including tyvek coveralls, gloves, and boot covers must be worn. PPE and plastic used to cover the ground must be placed into separate plastic bags and sealed if they are not disposed immediately into a trash receptacle.

Shower as soon as possible to remove any potential contamination. Any body part with suspected or actual exposure should be washed with "Tecnu" or other product designed for removing urushiol. If you do not have Tecnu wash with cold water. Do not take a bath, as the oils can form and invisible film on top of the water and contaminate your entire body upon exiting the bath.

Zanfel™ may also be used to treat exposed areas that are experiencing signs and symptoms of poison oak, ivy or sumac contamination. The CH2M HILL warehouses carry Zanfel™ products, which must be carried in First Aid Kits as deemed appropriate. Refer to the Zanfel™ information guide below for specific product and contact information.

Use products such as IvyBlock™ to prevent poison oak, ivy and sumac contamination. IvyBlock™ is approved by the FDA to prevent the rash caused by poison oak, ivy and sumac.

If there is exposure use the following first aid procedures, or others you may find to alleviate the pain and itching.

Poison Oak, Ivy, and Sumac First Aid

Are there any of these problems?

- Swelling in the throat, tongue and/or lips
- A hard time breathing or swallowing
- Weakness, dizziness
- Bluish lips and mouth
- Unconsciousness

YES

Give First Aid

Seek Emergency Care

Use emergency kit with adrenalin, if available, and Get Emergency Care.

NO

Do you have any of these problems?

- Skin that is very bright red.
- Pus.
- Rash that has spread to the mouth, eyes or genitals.
- Rash on large areas of the body or the face.

YES

Give First Aid

See Doctor

Give first aid before seeing doctor:

- Take a hot shower (only after rash develops), put the rash area in hot water or pour hot water over it. Make sure the water is not too hot to burn the skin. The hot water causes itching at first, but brings relief later. Do not use soap.
- Take an over-the-counter antihistamine, such as Benadryl, as stated on the label.
- For weeping blisters:
- Mix 2 teaspoons of baking soda in 1 quarter (4 cups) of water.
- Dip squares of gauze in this mixture.
- Cover the blisters with the wet gauze for 10 minutes, four times a day. (Do not apply this to the eyes.)

NO

Provide Self-Care

Urushiol Plant Facts

Urushiol Oil is Potent

- Only 1 nanogram (billionth of a gram) needed to cause rash
- Average is 100 nanograms for most people
- 1/4 ounce of urushiol is all that is needed to cause a rash in every person on earth
- 500 people could itch from the amount covering the head of a pin
- Specimens of urushiol several centuries old have found to cause dermatitis in sensitive people.
- 1 to 5 years is normal for urushiol oil to stay active on any surface including dead plants
- Derived from **urushi**, Japanese name for lacquer

Myth 	**Fact** 
Poison oak, ivy, and sumac are contagious	Rubbing the rashes won't spread poison ivy to other parts of your body (or to another person). You spread the rash only if urushiol oil -- the sticky, resinlike sugbstance that casues the rash -- has been left on your hands.
You can catch poison ivy simply by being near the plants	Direct contact is needed to release urusiol oil. Stay away from forest fires, direct burning, or anything else that can cause the oil to become airborne such as a lawnmower, trimmer, etc.
Leaves of three, let them be	Poison sumac has 7 to 13 leaves on a branch, although poison ivy and oak have 3 leaves per cluster
Do not worry about dead plants	Urushiol oil stays active on any surface, including dead plants, for up to 5 years.
Breaking the blisters releases urushiol oil that can spread	Not true. But your wounds can become infected and you may make the scarring worse. In very extreme cases, excessive fluid may need to be withdrawn by a doctor.

New Cream to Treat Exposure to Poison Plants

Exposure to poison oak, ivy and sumac can be uncomfortable, and in some cases the rash can become so severe that medical care is required. A new product is available Zanfel™ (www.zanfel.com) that helps prevent blistering and itching from becoming severe. If you are working in an area with poison oak, ivy or sumac, you can obtain this cream by contacting your regional Safety Program Assistants (SPAs):

SWR: Julie Yeager/SAC

NER: Lynn Bong/MKE

NWR: Donita O'Brien/SEA

SER: Vanessa Wheelus/GNV

CNR: Donita O'Brien/SEA

Please remember, the cream does not replace preventative measures, including:

- Avoiding contact with poison oak, ivy and sumac.
- Wearing Tyvek coveralls and gloves to prevent contact.
- Washing with Tecnu® (or a similar product) after potential exposure.
- Washing clothing and decontaminating equipment with an oil-cutting detergent.

More information about Zanfel (from Zanfel):

Zanfel™ is an effective wash for urushiol-induced contact dermatitis. Urushiol is the toxin known to cause the itching and rash associated with poison oak, ivy, sumac, poisonwood, and related plants. Zanfel works by surrounding urushiol and bonding with it, thereby enabling it to be rinsed away. Unlike some products that require use within 10-20 minutes of contact or that required continued use until the rash is gone (which can take up to 5 weeks), Zanfel offers relief at any stages of the reaction and often with only one wash. Individuals with particularly severe reactions may require additional washes. Most individuals experience relief from the itching within 30 seconds of application. The rash will begin to subside within hours if the reaction is mild to moderate. Severe and systemic cases will still require medical attention. Severe cases are defined as breakouts that are present on more than 15-percent of the body, and new breakouts continue to develop after day 4.

BROWN RECLUSE SPIDER

Its size - Adult brown recluse spiders have a leg span about the size of a quarter. Their body is about 3/8 inches long and about 3/16 inches wide. Males are slightly smaller in body length than females, but males have proportionally longer legs. Both sexes are venomous

Recluse spiders have been known to habitat most of the lower 48 states; however its typical range is shown on the attached map.

- If bitten stay calm, immediately apply ice to the bite and to try and collect the spider (said even a mangled part of the spider might help a professional with a diagnosis) and go to the ER.
- Shake out clothing and shoes before getting dressed.
- Inspect bedding and towels before use.
- Wear gloves when handling firewood, lumber, and rocks (be sure to inspect the gloves for spiders before putting them on).
- Remove bedskirts and storage boxes from underneath beds. Move the bed away from the wall.

- Exercise care when handling cardboard boxes (recluse spiders often are found in the space under folded cardboard flaps)

Attachment 11
Drug Testing Hospital Kit Notice

HOSPITAL KIT NOTICE

You are receiving this package because you are listed as a Project Manager and/or Superintendent/CM who is managing a CCI project or an INC project which requires drug testing. The items in the package, known as a 'hospital kit', are needed if there is a serious injury requiring medical care on your project.

It is your responsibility to make certain that this hospital kit is onsite at all times while construction is in progress.

For minor injuries - Hospital Kits are **NOT** required. After the injury is treated, the injured employee will be tested at the emergency care clinic or you can take the injured employee to the usual laboratory collection facility. Both the emergency care clinic and the laboratory collection facility already have drug testing kits and you will only be responsible to provide them with your normal Custody and Control Form (CCF) in order for the employee to be tested.

For more serious injuries that require hospital, ambulance, or paramedic care, we need to provide the collector with the 'hospital kit' in order for the drug test specimen to be properly collected. This package *contains everything that the medical provider will need* to collect the sample. It is critical that the 'hospital kit' accompanies all injured employee(s) to the hospital so they will get drug tested. If more than one employee is injured, you must send one kit for each employee that is to receive care at the hospital. After the kit is used, you must immediately contact Elaine Senecal/ORL to get a replacement kit. These kits must remain onsite and be available for emergencies at all times.

Location for Baltimore –

Contact Elaine Senecal/ORL for location

CH2M HILL Personnel also need on-line training:

http://www.int.ch2m.com/safety_counts/Training_Basic_Modules/Drug_desc.html

Attachment 12
Incident Report Form and
Root Cause Investigation Information

CH2MHILL

Incident Report Form (Hardcopy)

Fax completed form to:
425.462.5957
CH2M HILL Seattle Office
Attention: Corporate HS&E Department

Type of Incident (Select at least one)

- ☐ Injury/Illness
- ☐ Property Damage
- ☐ Spill/Release
- ☐ Environmental/Permit Issue
- ☐ Near Miss
- ☐ Other

General Information (Complete for all incident types)

Preparer's Name: _____ Preparer's Employee Number: _____
Date of Report: _____ Date of Incident: _____ Time of Incident: _____ am/pm

Type of Activity (Provide activity being performed that resulted in the incident)

- ☐ Asbestos Work
- ☐ Confined Space Entry
- ☐ Construction Mgmt- Haz Waste
- ☐ Construction Mgmt - Non-Haz Waste
- ☐ Demolition
- ☐ Drilling-Haz Waste
- ☐ Drilling-Non Haz Waste
- ☐ Drum Handling
- ☐ Electrical Work
- ☐ Excavation Trench-Haz Waste
- ☐ Excavation Trench-Non Haz
- ☐ Facility Walk Through
- ☐ General Office Work
- ☐ Keyboard Work
- ☐ Laboratory
- ☐ Lead Abatement
- ☐ Motor Vehicle Operation
- ☐ Moving Heavy Object
- ☐ Other (Specify) _____
- ☐ Process Safety Management
- ☐ Tunneling
- ☐ Welding
- ☐ Wetlands Survey
- ☐ Working from Heights
- ☐ Working in Roadways
- ☐ WWTP Operation

Location of Incident (Select one)

- ☐ Company Premises (CH2M HILL Office: _____)
- ☐ Field (Project #: _____ Project/Site Name: _____ Client: _____)
- ☐ In Transit (Traveling from: _____ Traveling to: _____)
- ☐ At Home

Geographic Location of Incident (Select region where the incident occurred)

- ☐ Northeast
- ☐ Southeast
- ☐ Northwest
- ☐ Southwest
- ☐ Corporate
- ☐ Canadian
- ☐ Asia Pacific
- ☐ Europe Middle East
- ☐ Latin America

If a CH2M HILL subcontractor was involved in the incident, provide their company name and phone number: _____

Describe the Incident (Provide a brief description of the incident): _____

_____

_____

Injured Employee Data (Complete for Injury/Illness incidents only)

If CH2M HILL employee injured

Employee Name: _____ Employee Number: _____

If CH2M HILL Subcontractor employee injured

Employee Name: _____ Company: _____

Injury Type

- ☐ Allergic Reaction
- ☐ Amputation
- ☐ Asphyxia
- ☐ Bruise/Contusion/Abrasion
- ☐ Burn (Chemical)
- ☐ Burn/Scald (Heat)
- ☐ Cancer
- ☐ Carpal Tunnel
- ☐ Concussion
- ☐ Cut/Laceration
- ☐ Dermatitis
- ☐ Dislocation
- ☐ Electric Shock
- ☐ Foreign Body in eye
- ☐ Fracture
- ☐ Freezing/Frost Bite
- ☐ Headache
- ☐ Hearing Loss
- ☐ Heat Exhaustion
- ☐ Hernia
- ☐ Infection
- ☐ Irritation to eye
- ☐ Ligament Damage
- ☐ Multiple (Specify)

_____

- ☐ Muscle Spasms
- ☐ Other (Specify)

_____

- ☐ Poisoning (Systemic)
- ☐ Puncture
- ☐ Radiation Effects
- ☐ Strain/Sprain
- ☐ Tendonitits
- ☐ Wrist Pain

Part of Body Injured

- ☐ Abdomen
- ☐ Ankle(s)
- ☐ Arms (Multiple)
- ☐ Back
- ☐ Blood
- ☐ Body System
- ☐ Buttocks
- ☐ Chest/Ribs
- ☐ Ear(s)
- ☐ Elbow(s)
- ☐ Eye(s)
- ☐ Face
- ☐ Finger(s)
- ☐ Foot/Feet
- ☐ Hand(s)
- ☐ Head
- ☐ Hip(s)
- ☐ Kidney
- ☐ Knee(s)
- ☐ Leg(s)
- ☐ Liver
- ☐ Lower (arms)
- ☐ Lower (legs)
- ☐ Lung
- ☐ Mind
- ☐ Multiple (Specify)

_____

- ☐ Neck
- ☐ Nervous System
- ☐ Nose
- ☐ Other (Specify)

_____

- ☐ Reproductive System
- ☐ Shoulder(s)
- ☐ Throat
- ☐ Toe(s)
- ☐ Upper Arm(s)
- ☐ Upper Leg(s)
- ☐ Wrist(s)

Nature of Injury

- ☐ Absorption
- ☐ Bite/Sting/Scratch
- ☐ Cardio-Vascular/Respiratory System Failure
- ☐ Caught In or Between
- ☐ Fall (From Elevation)
- ☐ Fall (Same Level)
- ☐ Ingestion
- ☐ Inhalation
- ☐ Lifting
- ☐ Mental Stress
- ☐ Motor Vehicle Accident
- ☐ Multiple (Specify)

_____

- ☐ Other (Specify)

_____

- ☐ Overexertion
- ☐ Repeated Motion/Pressure
- ☐ Rubbed/Abraded
- ☐ Shock
- ☐ Struck Against
- ☐ Struck By
- ☐ Work Place Violence

Initial Diagnosis/Treatment Date: _____

Type of Treatment

- ☐ Admission to hospital/medical facility
- ☐ Application of bandages
- ☐ Cold/Heat Compression/Multiple Treatment
- ☐ Cold/Heat Compression/One Treatment
- ☐ First Degree Burn Treatment
- ☐ Heat Therapy/Multiple treatment
- ☐ Multiple (Specify)

_____

- ☐ Heat Therapy/One Treatment
- ☐ Non-Prescriptive medicine
- ☐ None
- ☐ Observation
- ☐ Other (Specify)

_____

- ☐ Prescription- Multiple dose
- ☐ Prescription- Single dose
- ☐ Removal of foreign bodies
- ☐ Skin Removal
- ☐ Soaking therapy- Multiple Treatment
- ☐ Soaking Therapy- One Treatment
- ☐ Stitches/Sutures
- ☐ Tetanus
- ☐ Treatment for infection
- ☐ Treatment of 2nd /3rd degree burns
- ☐ Use of Antiseptics – multiple treatment
- ☐ Use of Antiseptics – single treatment
- ☐ Whirlpool bath therapy/multiple treatment
- ☐ Whirlpool therapy/single treatment
- ☐ X-rays negative
- ☐ X-rays positive/treatment of fracture

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Number of days doctor required employee to be off work: _____
Number of days doctor restricted employee's work activity: _____
Equipment Malfunction : Yes ☐ No ☐ Activity was a Routine Task: Yes ☐ No ☐
Describe how you may have prevented this injury: _____
_____

Physician Information
Name: _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Hospital Information
Name: _____
Address: _____
City: _____
Zip Code: _____
Phone: _____

Property Damage (Complete for Property Damage incidents only)

Property Damaged: _____ Property Owner: _____
Damage Description: _____
Estimated Amount: $ _____

Spill or Release (Complete for Spill/Release incidents only)

Substance (attach MSDS): _____ Estimated Quantity: _____
Facility Name, Address, Phone No.: _____
Did the spill/release move off the property where work was performed?: _____
Spill/Release From: _____ Spill/Release To: _____

Environmental/Permit Issue (Complete for Environmental/Permit Issue incidents only)

Describe Environmental or Permit Issue: _____
Permit Type: _____
Permitted Level or Criteria (e.g., discharge limit): _____
Permit Name and Number (e.g., NPDES No. ST1234): _____
Substance and Estimated Quantity: _____
Duration of Permit Exceedence: _____

Verbal Notification (Complete for all incident types)(Provide names, dates and times)

CH2M HILL Personnel Notified: _____
Client Notified: _____

Witnesses (Complete for all incident types)

Witness Information (First Witness)
Name: _____
Employee Number (CH2M HILL):_____
Address: _____
City: _____
Zip Code:_____
Phone: _____

Witness Information (Second Witness)
Name: _____
Employee Number (CH2M HILL: _____
Address: _____
City: _____
Zip Code:_____
Phone :_____

Additional Comments:
_____
_____
_____
_____

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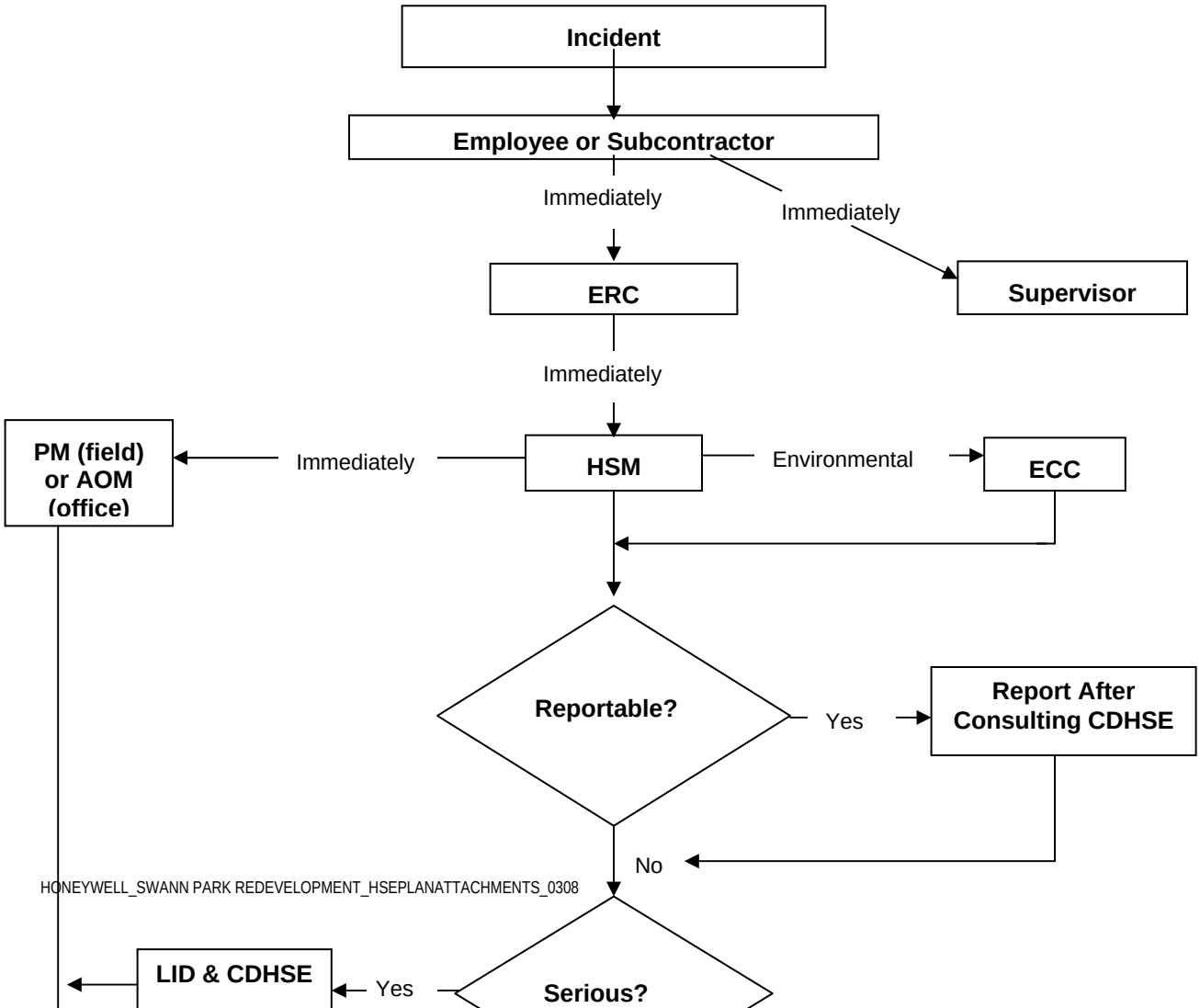
Incident Reporting and Investigation
Standard of Practice HSE-111

Incident Notification and Reporting Flowchart



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Incident Reporting and Investigation
Standard of Practice HSE-111

Investigation Guidelines

1.0 Introduction

This guideline is provided to assist in accessing, completing, and reviewing an incident investigation. It is important to remember the following when conducting an investigation:

- Gather relevant facts, focusing on fact finding, not fault finding.
- Draw conclusions, pitting facts together into a probable scenario.
- Determine incident root cause(s), which are basic causes on why an unsafe act/condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.

2.0 Documentation

The following should be included in the IRF to document the incident.

Description

- Provide a description of the event and the sequence of events and actions that took place prior to the incident. Start with the incident event and work backwards in time through all of the preceding events that directly contributed to the incident. The information should identify why the event took place as well as who was involved, when and where the event took place, and what actions were taken.

Cause Analysis

Using the form and flowchart in Attachment 11-1, the root cause of the incident will be determined. This form must be retained in the project and/or regional HS&E files.

Immediate Causes— List the substandard actions or conditions that directly affected the incident. The following are examples of immediate causes:

> ***Substandard Actions***: Operating equipment without authority; failure to warn; failure to secure; operating at improper speed; making safety device inoperable; using defective equipment; failing to use PPE; improper loading; improper lifting; improper position for task; under influence of alcohol or drugs; horseplay.
>
> ***Substandard Conditions:*** Exposure to hazardous materials; exposure to extreme temperatures; improper lighting; improper ventilation; congestion; exposure to fire and explosive hazard; defective tools, equipment, or materials; exposure to extreme noise; poor ventilation; poor visibility; poor housekeeping.

Basic Causes— List the personal and job factors that caused the incident. The following are examples of basic causes:

> ***Personal Factors:*** Capability; knowledge; skill; stress; motivation.
>
> ***Job Factors:*** Abuse or misuse; engineering; maintenance; purchasing; supervision; tools and equipment; wear and tear; work standards.

Corrective Action Plan

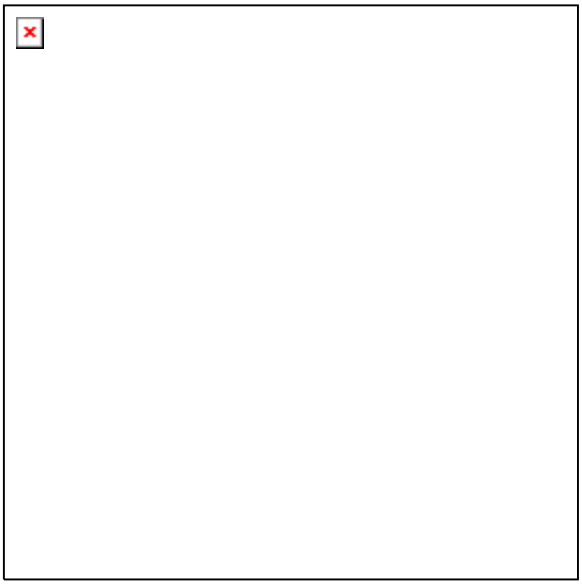
Include all corrective actions taken or those that should be taken to prevent recurrence of the incident. Include the specific actions to be taken, the employer and personnel responsible for implementing the actions, and a time frame for completion. Be sure the corrective actions address the causes. For example, training may prevent recurrence of an incident caused by a lack of knowledge, but it may not help an incident caused by improper motivation.

The following are examples of management programs that may be used to control future incidents. These programs should be considered when determining specific corrective actions.

> ***Management Programs***: Accident/incident analysis; emergency preparedness; engineering controls; general promotion; group meetings; health control; hiring and placement; leadership and administration; management training; organizational rules; personal protective equipment; planned inspections; program audits; program controls; purchasing controls; task analysis and procedures; task observation

3.0 Attachments

Attachment 12-1 Root Cause Analysis Form and Flowchart



CH2MHILL

Incident Reporting and Investigation
Standard of Practice HSE-111
Attachment 12-1: Investigation Guidelines

Root Cause Analysis Form and Flowchart

Root Cause Analysis Form

Root Cause Analysis (RCA)

Root Cause Categories (RCC): Select the RCC numbered below that applies for the root cause (RC) and/or contributing factor (CF) in the first column, then describe the specific root cause and corrective actions in each column.

1. **Lack of skill or knowledge**
2. **Lack of or inadequate operational procedures or work standards**
3. **Inadequate communication of expectations regarding procedures or work standards**
4. **Inadequate tools or equipment**
5. **Correct way takes more time and/or requires more effort**
6. **Short-cutting standard procedures is positively reinforced or tolerated**
7. **Person thinks there is no personal benefit to always doing the job according to standards**

RCC #	Root Cause(s)	Corrective Actions	RC[1]	CF[2]	Due Date	Completion Date	Date Verified

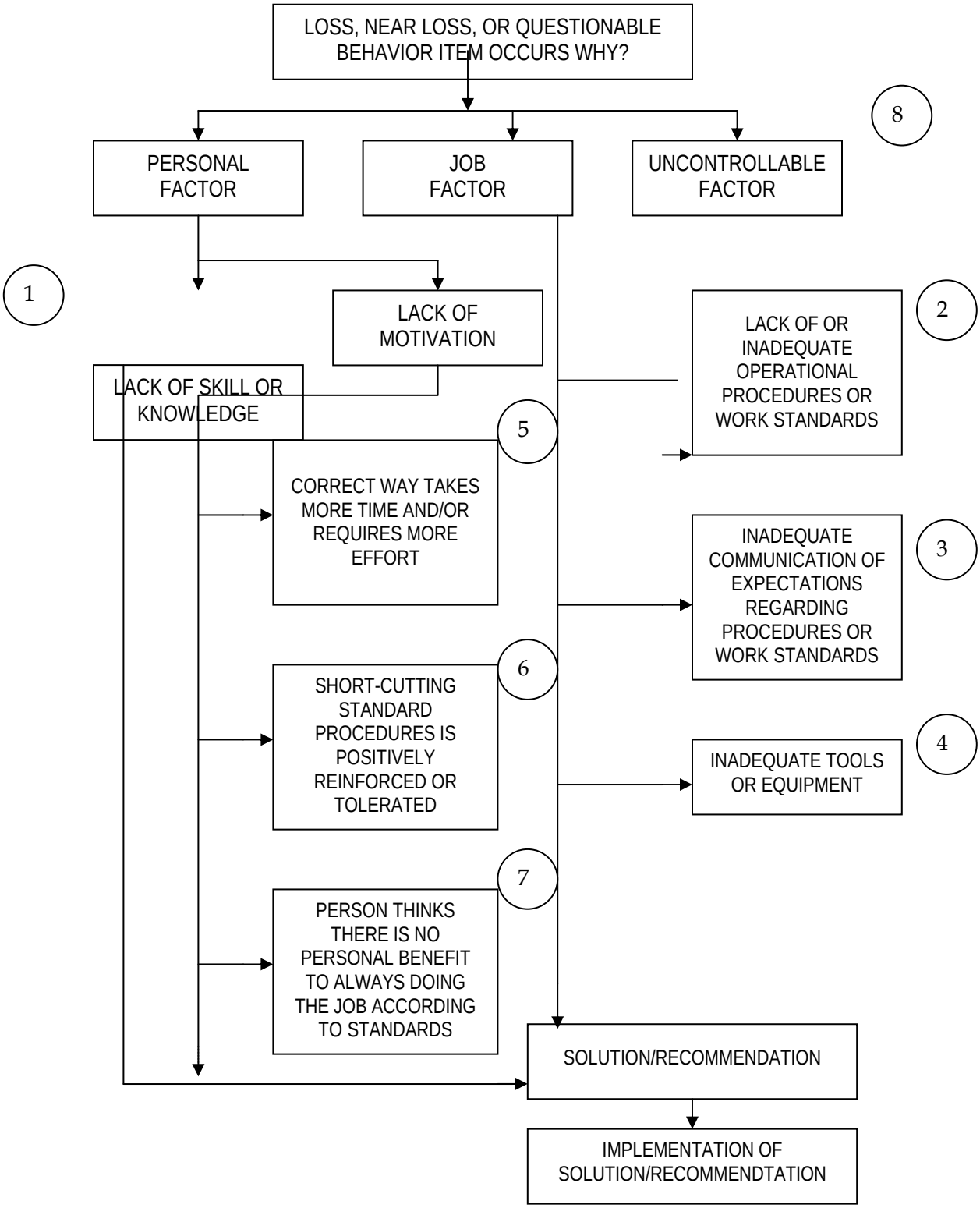
[1] RC = Root Cause; [2] CF = Contributing Factors (check which applies)

Investigation Team Members

Name	Job Title	Date

Results of Solution Verification and Validation		
Reviewed By		
Name	Job Title	Date

Root Cause Analysis Flowchart



Attachment 13
Air Sampling Plan – Race Street Investigation

Honeywell – Swann Park Investigations

Hexavalent Chromium, Arsenic and/or Total Particulate Air Sampling Plan

This Air Sampling Plan will be in effect for those specific projects that require air sampling be conducted. Personal and/or perimeter sampling approaches may be required based on the specific scope of work being conducted. Contact the HSM for when personal and/or perimeter air sampling will be required

Personal and perimeter air sampling for arsenic and/or total particulates may be performed during upcoming park redevelopment activities at the Swann Park site in Baltimore, Maryland. All samples will be collected and analyzed in accordance with the Occupational Safety and Health Administration (OSHA) Method ID-105 or NIOSH Method 7900 for arsenic and NIOSH 0500 for total particulates. All samples must be analyzed by a laboratory that is accredited by the American Industrial Hygiene Association (AIHA) for that method. Additionally, real time dust monitoring will be performed using an MIE DataRAM 4000, or equivalent, real-time aerosol (dust) monitor at an upwind and downwind location.

If applicable, CH2M HILL will be collecting personal samples from CH2M HILL and subcontractor personnel.

Personal Air Sampling

Personal air sampling is not anticipated during the Swann Park Redevelopment project. If site conditions change and personal air sampling is warranted, the following personal air sampling approach will apply.

Sampling Approach

Personal air samples will be collected on all workers conducting intrusive work in high arsenic areas of the site.. It is anticipated that a quick turn-around on the laboratory analysis of these samples will be obtained, so that personal exposure results will be available before the second week of drilling.

Workers performing these activities will need to wear Level C, full-face air purifying respirators (APRs) with P100 filter cartridges until representative, worst-case scenario personal exposure air sampling results are obtained. (It is anticipated that this may take one week.) At that time, the level of protection may be downgraded if exposure concentrations are below OSHA's Permissible Exposure Level for arsenic of 10 $\mu g/m^3$.

Based on the results of the initial personal air sampling, a periodic personal air sampling plan will be developed and implemented for the remainder of the field event. Factors that will be considered in developing the periodic personal air sampling plan include, but are not limited to: (1) results of the first round of personal air sampling, (2) level of soil contamination anticipated in future borings based on previous soil sampling data, (3) soil conditions (wetness) anticipated, (4) level of work activity

anticipated, and (5) correlation of real time dust monitoring (see below) with actual personal air sampling results obtained.

CH2M HILL will contact representatives of each contractor regarding the results of the air monitoring for each of their employees. The analytical laboratory will submit the results for each of their employees directly to them. It is and will be the responsibility of each contractor to determine and assess the safety and determine the appropriate levels of protection for each of their employees, while maintaining full compliance with all applicable regulatory requirements. This assessment will be based primarily on the results of the personal and area air monitoring samples that will be collected during the first week of applicable field work activities. The potential to downgrade levels of protection will be discussed between each contractor and CH2M HILL and prior to downgrading protection levels full agreement between the contractor's representative and CH2M HILL's Health and Safety Management team shall have to be made and documented. Each contractor is responsible for the analytical costs for all personal air monitoring samples collected from their employees.

Sampling Method

Personal air samples will be collected in accordance with NIOSH Method 7900 using a 37 mm diameter cellulose ester membrane filter (0.8 um pore size) contained in a polystyrene cassette. A calibrated sampling pump will be used to draw a representative air sample from the breathing zone of the employee through the cassette and collect particulate on the filter. The calibrated sampling pumps will sample within $\pm$ 5% of the recommended flow rate of 2 L/min. Samples will be collected for an 8-hour period or a full shift period, resulting in a total air volume of approximately 960 L. Tygon or other flexible tubing will be used for connecting to the pumps. One sample per shift will be collected from each worker that is working in around the drilling area.

Perimeter Air Sampling

Sampling Approach

Perimeter air samples will be collected during the excavation of arsenic impacted soil phase of the redevelopment project.

Up to four perimeter samples may be collected daily. At a minimum two samples will be collected; one directly downwind, based on morning wind directions, at the outer perimeter of the work zone and one collected upwind. Additional samples may be collected at the outer perimeter of the work zone in a crosswind location. The wind direction will be recorded by field staff on an hourly basis. Perimeter air samples will be collected at approximate breathing zone height using NIOSH Method 7900 (or equivalent) and analyzed for arsenic by Travelers Laboratories.

Based on the results of the initial perimeter air sampling, a periodic perimeter air sampling plan may be developed and implemented for the remainder of the field event. Factors that will be considered in developing the periodic perimeter air sampling plan include, but are not limited to: (1) results of the first round of perimeter air sampling, (2) level of soil contamination anticipated in future borings based on previous soil sampling data, (3) soil conditions (wetness) anticipated, (4) level of work activity anticipated, and (5) correlation of real time dust monitoring (see below) with actual personal air sampling results obtained.

Real Time Dust Monitoring

Sampling Approach

Real time dust monitoring will be performed using MIE DataRAM 4000 dust monitors, or equivalent, throughout the duration of field activities. Each day, a DataRAM will be placed near the breathing zone in a downwind and upwind location at the discretion of the SC. The CH2M HILL Safety Coordinator, or designee, will record the DataRAM periodically, along with a brief description of the activity taking place. Additionally, the DataRAM results will be downloaded each day so that the fluctuations in total dust concentrations can be observed.

Based on the results of the DataRAM total dust monitoring, personal air sampling, and perimeter air sampling, a real time air monitoring plan will be developed and implemented for the remainder of the field event. Factors that will be considered in developing the DataRAM real time dust monitoring plan include, but are not limited to: (1) results of the first round of personal and perimeter air sampling, (2) level of soil contamination anticipated in future borings based on previous soil sampling data, (3) soil conditions (wetness) anticipated, (4) level of work activity anticipated, and (5) correlation of real time dust monitoring with actual personal air sampling results obtained.

Notification of Results

The following applies for Personal air sampling activities.

Upon receipt of air sampling results from the analytical laboratory, the project Health and Safety Manager (HSM) will communicate the results to the monitored CH2M HILL employees through a written notification within 5 working days. The written notification should include, at a minimum, the following information:

- Hazards measured
- Employee's measured exposure
- Relevant Occupational Exposure Limit being applied
- Significance or risk of the employee's measured exposure
- Signs and symptoms of exposure

A copy of the notification should be maintained by CH2M HILL as an exposure record according to the requirements of CH2M HILL Standard of Practice HSE-119, Recordkeeping.

Air monitoring results will be communicated to CH2M HILL staff on a regular basis by the project Safety Coordinator, but at a minimum whenever an action level is exceeded. The SC should communicate information to subcontractors as outlined in CH2M HILL SOP HSE-215 (Contracts, Subcontracts, and HS&E Management Practices).

The analytical laboratory will submit sample results directly to each subcontractor for each of their personnel included in this air sampling program. Each subcontractor shall comply with OSHA standards 1910.120 and 1910.1026 regarding employee notification and recordkeeping requirement.

Recordkeeping

Documentation of air monitoring and air sampling must be retained as part of the project file, which includes:

- Calibration and IH Sampling Logs (contained in CH2M HILL HS&E Field Equipment Manual)
- Instrument reading
- Weather conditions
- Sample location (breathing zone, headspace)
- Operator's name and signature
- Employee's social security number (if required by regulations)
- Date and time of the sample

Exposure monitoring records must be preserved according to the guidelines established in CH2M HILL SOP HSE-119, Recordkeeping.